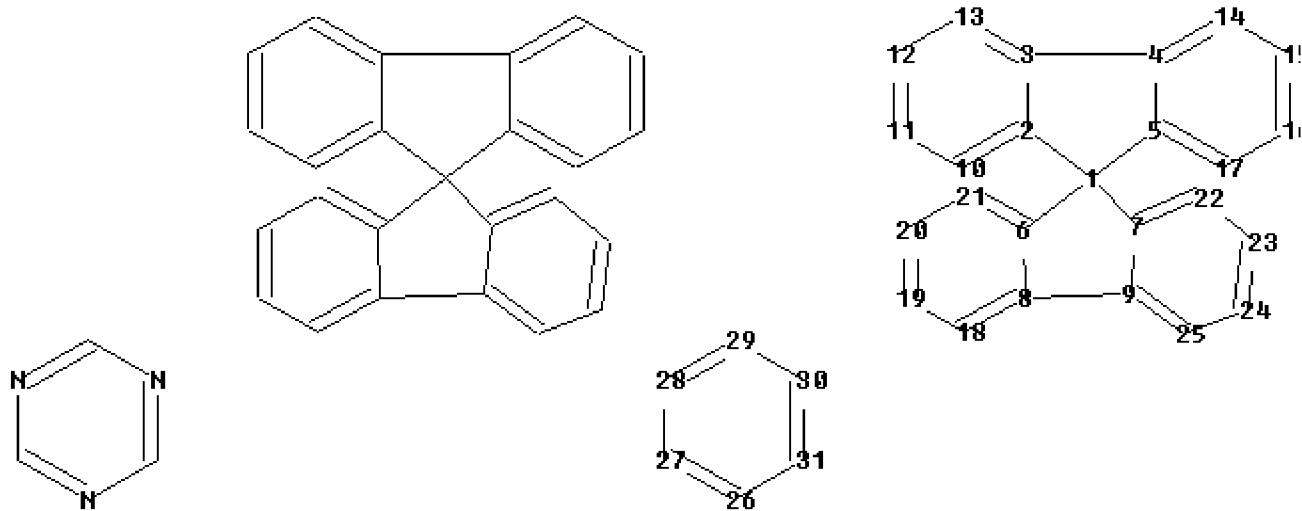


# STN-10/580, 491

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Uploading C:\Program Files\STNEXP\Queries\10580491#1.str



ring nodes :

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23  
24 25 26 27 28 29 30 31

ring bonds :

1-2 1-5 1-6 1-7 2-3 2-10 3-4 3-13 4-5 4-14 5-17 6-8 6-21 7-9 7-22  
8-9 8-18 9-25 10-11 11-12 12-13 14-15 15-16 16-17 18-19 19-20 20-21 22-  
23 23-24 24-25  
26-27 26-31 27-28 28-29 29-30 30-31

exact bonds :

1-2 1-5 1-6 1-7 3-4 8-9

normalized bonds :

2-3 2-10 3-13 4-5 4-14 5-17 6-8 6-21 7-9 7-22 8-18 9-25 10-11 11-12  
12-13 14-15 15-16 16-17 18-19 19-20 20-21 22-23 23-24 24-25 26-27 26-31  
27-28 28-29

29-30 30-31

isolated ring systems :

containing 1 : 26 :

Match level :

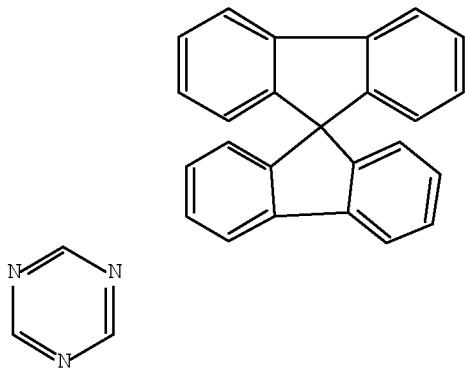
1:Atom 2:Atom 3:Atom 4:Atom 5:Atom 6:Atom 7:Atom 8:Atom 9:Atom 10:Atom  
11:Atom 12:Atom 13:Atom 14:Atom 15:Atom 16:Atom 17:Atom 18:Atom 19:Atom  
20:Atom 21:Atom  
22:Atom 23:Atom 24:Atom 25:Atom 26:Atom 27:Atom 28:Atom 29:Atom 30:Atom  
31:Atom

L1 STRUCTURE UPLOADED

=> d 11

L1 HAS NO ANSWERS

L1 STR



Structure attributes must be viewed using STN Express query preparation.

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=> s 11
SAMPLE SEARCH INITIATED 15:57:59 FILE 'REGISTRY'
SAMPLE SCREEN SEARCH COMPLETED - 15 TO ITERATE

100.0% PROCESSED 15 ITERATIONS 1 ANSWERS
SEARCH TIME: 00.00.01
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FULL FILE PROJECTIONS: ONLINE **COMPLETE**
BATCH **COMPLETE**
PROJECTED ITERATIONS: 68 TO 532
PROJECTED ANSWERS: 1 TO 80
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L2 1 SEA SSS SAM L1

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=> s 11 full
FULL SEARCH INITIATED 15:58:07 FILE 'REGISTRY'
FULL SCREEN SEARCH COMPLETED - 247 TO ITERATE
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100.0% PROCESSED 247 ITERATIONS 39 ANSWERS
SEARCH TIME: 00.00.01
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L3 39 SEA SSS FUL L1

This file contains CAS Registry Numbers for easy and accurate substance identification.

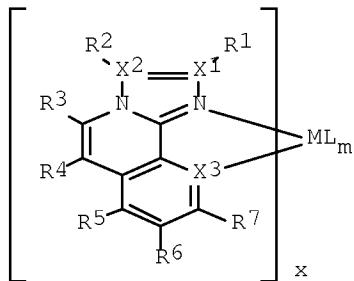
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L4 13 L3
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L4 ANSWER 1 OF 13 CAPLUS COPYRIGHT 2010 ACS on STN
ACCESSION NUMBER: 2010:968590 CAPLUS Full-text
DOCUMENT NUMBER: 153:287153
TITLE: Cyclometalated transition metal complexes with
condensed polyheterocyclic bidentate ligands as
dopants for organic electroluminescent devices
INVENTOR(S): Stoessel, Philipp; Heil, Holger; Jooseten, Dominik;
Pflumm, Christof; Gerhard, Anja; Breuning, Esther
```

PATENT ASSIGNEE(S): Merck Patent GmbH, Germany  
 SOURCE: PCT Int. Appl., 208pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: German  
 FAMILY ACC. NUM. COUNT: 2  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2010086089	A1	20100805	WO 2010-EP177	20100114
W: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW				
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
DE 102009007038	A1	20100805	DE 2009-102009007038	20090202
PRIORITY APPLN. INFO.:			DE 2009-102009007038A	20090202
GI				



AB Transition metal complexes of cyclometalated condensed heterocyclic ligands, preferably complexes I [1, M = transition metal, preferably M = Ir, Pt; R = H, halo, amino, CN, NO<sub>2</sub>, silyl, boryl, acyl, phosphoryl, sulfinyl, sulfonyl, sulfate, C<sub>1</sub>-40 alkyl(oxy), alkylthio, aryl, hetaryl, etc.; L = an auxiliary ligand, preferably, L = acac, 2-picolinato, pyrazolylborato; x = 1-4, m = 0-6, preferably, x = 1-3, m = 0, 1], provided that the ring atoms together feature a 14 $\pi$ -electron aromatic system, useful as dopants for light-emitting layers in blue-emitting organic electroluminescent devices, were prepared by cyclometalation of the corresponding ligands or cycloaddn. of carbonyl compds. or alkynes to coordinated 1-aminoisoquinolines. In an example, reaction of 12.5 mmol of the ligand, imidazo[2,1-a]isoquinoline with 2.5 mmol of Na[Ir(acac)<sub>2</sub>Cl<sub>2</sub>] in 5 mL of triethyleneglycol at 240° for 24 h gave the complex I (1a, M = Ir, R<sub>1</sub>-R<sub>7</sub> = H, X<sub>1</sub> = X<sub>3</sub> = C; x = 3, m = 0) with 19% yield. In another example, an OLED device was constructed, comprising 1a as a dopant

to a 40 nm light-emitting layer [tris-6-phenyl-2-pyridinylphosphine oxide:bis(N,N'-diphenyl-1,2-phenylenediaminato)silane:1a = 80:10:10], which exhibited an efficiency of 9.4 cd/A at 1000 cd m<sup>-2</sup> and 6.1 V voltage, having a lifetime of 1300 h.

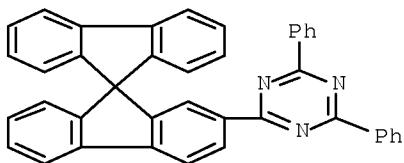
IT 1207176-84-8

RL: NANO (Nanomaterial); PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses) (preparation of cyclometalated iridium and platinum complexes with condensed

heterocyclic imidazo[2,1-a]isoquinoline ligands as dopants for light-emitting layers in OLEDs)

RN 1207176-84-8 CAPLUS

CN 1,3,5-Triazine, 2,4-diphenyl-6-(9,9'-spirobi[9H-fluoren]-2-yl)- (CA INDEX NAME)



REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 2 OF 13 CAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 2010:815182 CAPLUS Full-text

DOCUMENT NUMBER: 153:130227

TITLE: Organic electroluminescent devices comprising triazine derivative-based electron transport layers

INVENTOR(S): Pflumm, Christof; Leu, Simone; Kaiser, Joachim; Parham, Amir; Voges, Frank; Kroeber, Jonas; Buesing, Arne

PATENT ASSIGNEE(S): Merck Patent GmbH, Germany

SOURCE: Ger. Offen., 57pp.

CODEN: GWXXBX

DOCUMENT TYPE: Patent

LANGUAGE: German

FAMILY ACC. NUM. COUNT: 2

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 102008064200	A1	20100701	DE 2008-102008064200	20081222
KR 2010073954	A	20100701	KR 2009-32570	20090415
WO 2010072300	A1	20100701	WO 2009-EP8441	20091126
W: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW				
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI,				

SK, SM, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE,  
SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG,  
ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

PRIORITY APPLN. INFO.:

DE 2008-102008064200A 20081222

GI

\* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT \*

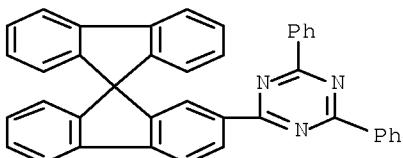
AB Organic electroluminescent devices having cathode-side electron transport layers are described in which the electron transport layer includes  $\geq 1$  compds. described by the general formulas I and II (Ar, Ar' = (un)substituted triazine groups; R1 = independently selected at each occurrence from H, D, F, Cl, Br, I, CHO, amine groups, CN, NO<sub>2</sub>, silyls, etc.; m = 0-3; n = 0-1; and o = 0-4 when n = 0 on the same ring and 0-3 when n = 1 on the same ring); alternately the the electron transport layer may comprise  $\geq 1$  compds. described by the general formulas III or IV (Ar<sub>2</sub> = independently selected at each occurrence from monovalent (un)substituted C<sub>5</sub>-60 (hetero)aromatic groups; and Ar<sub>3</sub> = a bivalent (un)substituted C<sub>5</sub>-60 (hetero)aromatic group) doped with an organic alkali metal compound Methods for fabricating the devices using vapor deposition and/or solution deposition methods to form the layers, mixts. of III or IV and  $\geq 1$  organic alkali metal compound, and selected compds. described by the general formulas III and IV are also described.

IT 1207176-84-8

RL: TEM (Technical or engineered material use); USES (Uses)  
(organic electroluminescent devices comprising triazine derivative-based electron transport layers)

RN 1207176-84-8 CAPLUS

CN 1,3,5-Triazine, 2,4-diphenyl-6-(9,9'-spirobi[9H-fluoren]-2-yl)- (CA INDEX NAME)



L4 ANSWER 3 OF 13 CAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 2010:812409 CAPLUS Full-text

DOCUMENT NUMBER: 153:130216

TITLE: Organic electroluminescent devices comprising triazine derivative-based electron transport layers

INVENTOR(S): Pflumm, Christof; Leu, Simone; Kaiser, Joachim; Parham, Amir Hossain; Voges, Frank; Kroeber, Jonas Valentin; Buesing, Arne

PATENT ASSIGNEE(S): Merck Patent G.m.b.H., Germany

SOURCE: PCT Int. Appl., 95pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: German

FAMILY ACC. NUM. COUNT: 2

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2010072300	A1	20100701	WO 2009-EP8441	20091126
W: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
DE 102008064200	A1	20100701	DE 2008-102008064200	20081222
PRIORITY APPLN. INFO.:				
DE 2008-102008064200A 20081222				
GI				

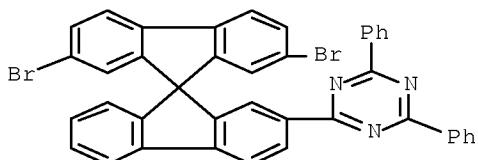
\* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT \*

AB      Organic electroluminescent devices having cathode-side electron transport layers are described in which the electron transport layer includes  $\geq 1$  compds. described by the general formulas I and II (Ar, Ar' = (un)substituted triazine groups; R1 = independently selected at each occurrence from H, D, F, Cl, Br, I, CHO, amine groups, CN, NO<sub>2</sub>, silyls, etc.; m = 0-3; n = 0-1; and o = 0-4 when n = 0 on the same ring and 0-3 when n = 1 on the same ring); alternately the the electron transport layer may comprise  $\geq 1$  compds. described by the general formulas III or IV (Ar<sub>2</sub> = independently selected at each occurrence from monovalent (un)substituted C<sub>5</sub>-60 (hetero)aromatic groups; and Ar<sub>3</sub> = a bivalent (un)substituted C<sub>5</sub>-60 (hetero)aromatic group) doped with an organic alkali metal compound Methods for fabricating the devices using vapor deposition and/or solution deposition methods to form the layers, mixts. of III or IV and  $\geq 1$  organic alkali metal compound, and selected compds. described by the general formulas III and IV are also described.

IT      1233200-66-2P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(organic electroluminescent devices comprising triazine derivative-based electron transport layers)

RN      1233200-66-2 CAPLUS

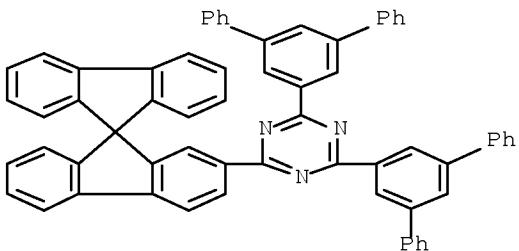
CN      1,3,5-Triazine, 2-(2',7'-dibromo-9,9'-spirobi[9H-fluoren]-2-yl)-4,6-diphenyl- (CA INDEX NAME)



IT 1233200-52-6P 1233200-56-0P 1233200-64-0P  
RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
(organic electroluminescent devices comprising triazine derivative-based electron transport layers)

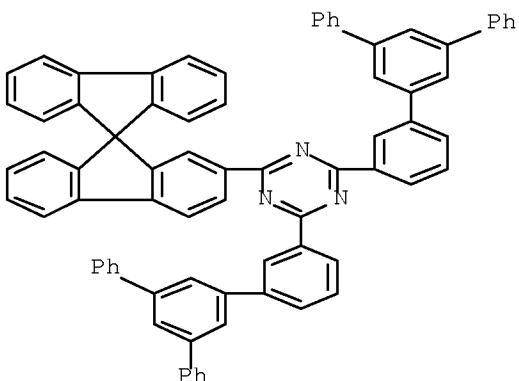
RN 1233200-52-6 CAPLUS

CN 1,3,5-Triazine, 2-(9,9'-spirobi[9H-fluoren]-2-yl)-4,6-bis([1,1':3',1'''-terphenyl]-5'-yl)- (CA INDEX NAME)



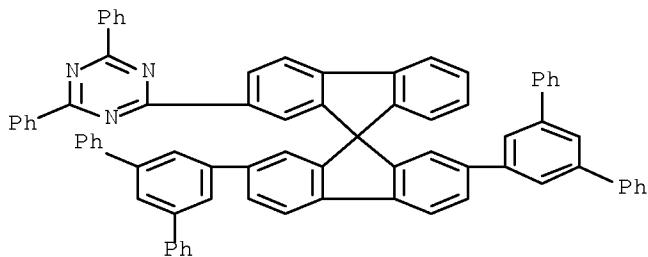
RN 1233200-56-0 CAPLUS

CN 1,3,5-Triazine, 2,4-bis(5'-phenyl[1,1':3',1'''-terphenyl]-3-yl)-6-(9,9'-spirobi[9H-fluoren]-2-yl)- (CA INDEX NAME)



RN 1233200-64-0 CAPLUS

CN 1,3,5-Triazine, 2-[2,7-bis([1,1':3',1'''-terphenyl]-5'-yl)-9,9'-spirobi[9H-fluoren]-2-yl]-4,6-diphenyl- (CA INDEX NAME)

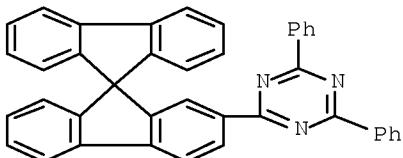


IT 1207176-84-8

RL: TEM (Technical or engineered material use); USES (Uses)  
(organic electroluminescent devices comprising triazine derivative-based  
electron transport layers)

RN 1207176-84-8 CAPLUS

CN 1,3,5-Triazine, 2,4-diphenyl-6-(9,9'-spirobi[9H-fluoren]-2-yl)- (CA INDEX  
NAME)



REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 4 OF 13 CAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 2010:621353 CAPLUS Full-text

DOCUMENT NUMBER: 152:592162

TITLE: Cyclic arylphosphonic acid derivatives as  
supplementary materials for organic electroluminescent  
devices

INVENTOR(S): Stoessel, Philipp; Heil, Holger; Joosten, Dominik;  
Pflumm, Christof; Gerhard, Anja; Breuning, Esther;  
Parham, Amir Hossain

PATENT ASSIGNEE(S): Merck Patent GmbH, Germany

SOURCE: PCT Int. Appl., 101pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: German

FAMILY ACC. NUM. COUNT: 3

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2010054730	A1	20100520	WO 2009-EP7406	20091015
W: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA,				

MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE,  
PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV,  
SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW  
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU,  
IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI,  
SK, SM, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE,  
SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG,  
ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

DE 102008056688 A1 20100512 DE 2008-102008056688 20081111

PRIORITY APPLN. INFO.: DE 2008-102008056688A 20081111  
DE 2009-102009022858A 20090527

OTHER SOURCE(S): MARPAT 152:592162

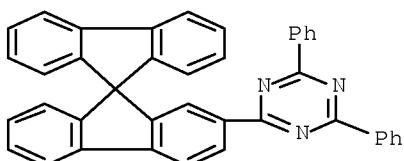
AB Phosphorus heterocyclic compds., preferably diazaphosphole, oxazaphosphole oxides, sulfides [QZ2P(X)]nAr (1, Q = benzo, areno, hetareno, substituted 1,2-ethenediyl, etc.; Z = imino, O, S; X = O, S, preferably X = O; Ar = C6-60 aryl, arylene; n = 1-6, preferably n = 1-3), useful as matrix and/or supplementary materials for organic electroluminescent devices (OLEDs), preferably for blue- and green-emitting OLEDs, based on phosphorescent transition metal complexes, improving performance, efficiency and lifetime of the OLEDs, for making of emitting, electron-, exciton-, or hole-blocking layers, were prepared by heterocyclization of aromatic o-diamines, o-aminophenols Q(AH)2 with phosphonic dichlorides Ar[P(X)Cl2]n, which, in turn were prepared from the corresponding arylphosphonic, arenediphosphonic and arenetriphosphonic acids. The prepared compds. were tested in model OLEDs by doping the emission and hole-blocking layers, showing increase of efficiency and lifetime of the devices. In an example, 2,2'-(1,4-phenylene)bis(5,6-dimethyl-1,3-diphenyl[1,3,2]benzophosphole) P,P'-dioxide (1a, Q = 4,5-dimethylbenzene-1,2-diyl, Z = NPh, X = O, n = 2, Ar = 1,4-C6H4) was prepared by heterocyclization of 4,5-dimethyl-N,N'-diphenyl-1,2-benzenediamine with 1,4-benzenediphosphonic tetrachloride, Cl2P(O)-1,4-C6H4P(O)Cl2. In another example, the compound 1a, as matrix material doped with 10% tris(3-methyl-2-phenylpyridine)iridium for 30 nm-thick light-emitting layer, showed 57 cd/A efficiency at 1000 cd m-2 light d. and 560 h lifetime at 4000 cd m-2 light d., compared with 42 cd/A and 230 h for similar device using bis(9,9'-spirobifluoren-2-yl)phenylphosphine oxide as matrix material.

IT 1207176-84-8

RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
(preparation of cyclic arylphosphonic acid derivs.,  
benzo[1,3,2]-diazaphosphole oxides as supplementary materials for organic electroluminescent devices)

RN 1207176-84-8 CAPLUS

CN 1,3,5-Triazine, 2,4-diphenyl-6-(9,9'-spirobi[9H-fluoren]-2-yl)- (CA INDEX NAME)



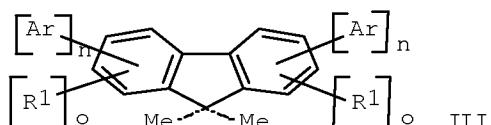
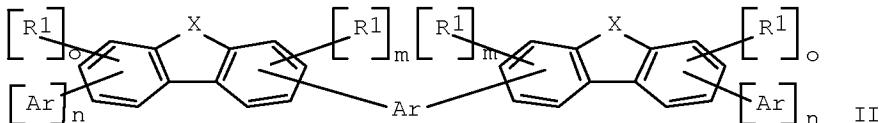
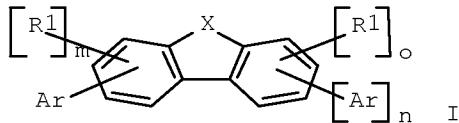
REFERENCE COUNT:

5

THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 5 OF 13 CAPLUS COPYRIGHT 2010 ACS on STN  
 ACCESSION NUMBER: 2010:180208 CAPLUS Full-text  
 DOCUMENT NUMBER: 152:274907  
 TITLE: Organic electroluminescent devices with emitting  
       layers using fluorene-like and spirobifluorene-like  
       hosts  
 INVENTOR(S): Parham, Amir; Kaiser, Joachim; Gerhard, Anja; Kroeber,  
       Jonas  
 PATENT ASSIGNEE(S): Merck Patent GmbH, Germany  
 SOURCE: Ger. Offen., 32pp.; Chemical Indexing Equivalent to  
       152:274903 (WO)  
       CODEN: GWXXBX  
 DOCUMENT TYPE: Patent  
 LANGUAGE: German  
 FAMILY ACC. NUM. COUNT: 2  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 102008036982	A1	20100211	DE 2008-102008036982	20080808
WO 2010015306	A1	20100211	WO 2009-EP4954	20090708
W: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
PRIORITY APPLN. INFO.: DE 2008-102008036982A 20080808				
GI				



AB Organic electroluminescent devices are described which include  $\geq 1$  emitting layer comprising a phosphorescent compound (especially a metal complex) and  $\geq 1$  compound are described by the general formula I and II (Ar = independently selected at each occurrence from (un)substituted triazine, pyrazine, pyrimidine, pyridazine, pyrazole, imidazole, oxazole, oxadiazole, or thiazole; X = independently selected at each occurrence III or a bivalent bridge selected from BR1, C(R1)2, Si(R1)2, C:C(R1)2, O, S, S:O, SO2, NR1, PR1, and P(:O)R1; R1 = independently selected at each occurrence from H, D, F, Cl, Br, I, CHO, arylamine, CN, C1-40 alkyl, C1-40 alkoxy, etc., and  $\geq 2$  adjacent R1s can bond to form ring systems; n = 0 or 1; m = 0-3; and o = 0-4 if n = 0 and 0-3 if n = 1). A method for producing the devices including the use of a sublimation or organic vapor deposition method, organic vapor jet printing method, a carrier gas sublimation method, a solution deposition method, or solution printing method to form layers is also described. Use of the compds. as matrix materials in organic electroluminescent devices and mixts. including the compds. and  $\geq 1$  phosphorescent compound are claimed as well.

IT 853154-59-3P, 2,7-Bis(4,6-diphenyl-1,3,5-triazin-2-yl)-2',7'-di-

tert-butylspiro-9,9'-bifluorene 853154-60-6P,

2,7-Bis(4,6-diphenyl-1,3,5-triazin-2-yl)spiro-9,9'-bifluorene

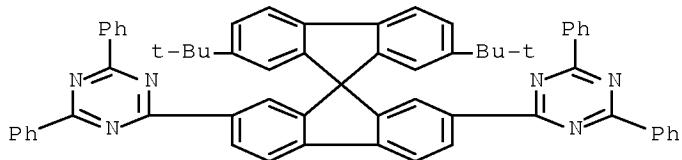
1207176-84-8P, 2-(4,6-Diphenyl-1,3,5-triazin-2-yl)spiro-9,9'-bifluorene

RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(organic electroluminescent devices with emitting layers using fluorene-like and spirobifluorene-like hosts)

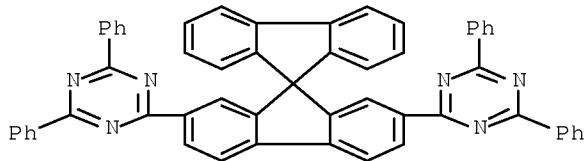
RN 853154-59-3 CAPLUS

CN 1,3,5-Triazine, 2,2'-(2',7'-bis(1,1-dimethylethyl)-9,9'-spirobi[9H-fluorene]-2,7-diyl)bis[4,6-diphenyl- (9CI) (CA INDEX NAME)



RN 853154-60-6 CAPLUS

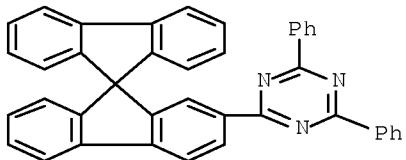
CN 1,3,5-Triazine, 2,2'-(9,9'-spirobi[9H-fluorene]-2,7-diyl)bis[4,6-diphenyl- (9CI) (CA INDEX NAME)



RN 1207176-84-8 CAPLUS

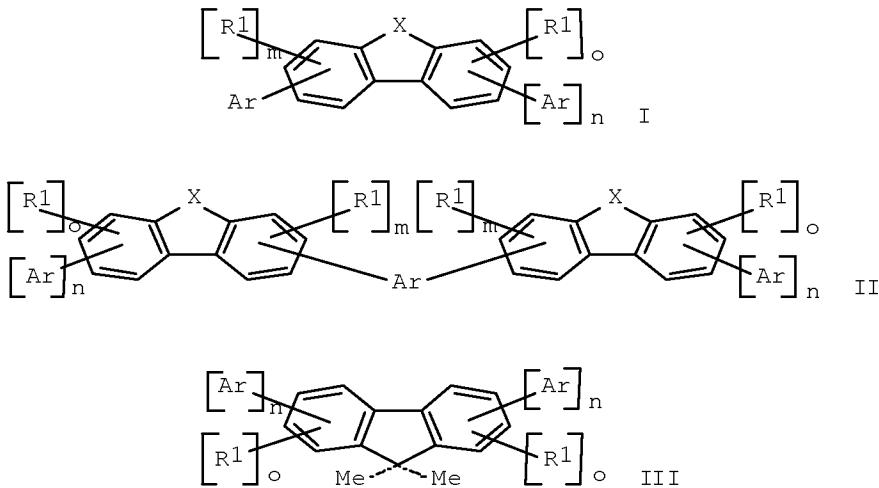
CN 1,3,5-Triazine, 2,4-diphenyl-6-(9,9'-spirobi[9H-fluoren]-2-yl)- (CA INDEX

NAME)



L4 ANSWER 6 OF 13 CAPLUS COPYRIGHT 2010 ACS on STN  
ACCESSION NUMBER: 2010:178610 CAPLUS Full-text  
DOCUMENT NUMBER: 152:274903  
TITLE: Organic electroluminescent devices with emitting layers using fluorene-like and spirobifluorene-like hosts  
INVENTOR(S): Parham, Amir Hossain; Kaiser, Joachim; Gerhard, Anja; Kroeber, Jonas Valentin  
PATENT ASSIGNEE(S): Merck Patent GmbH, Germany  
SOURCE: PCT Int. Appl., 55pp.; Chemical Indexing Equivalent to 152:274907 (DE)  
CODEN: PIXXD2  
DOCUMENT TYPE: Patent  
LANGUAGE: German  
FAMILY ACC. NUM. COUNT: 2  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2010015306	A1	20100211	WO 2009-EP4954	20090708
W: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW				
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
DE 102008036982	A1	20100211	DE 2008-102008036982	20080808
PRIORITY APPLN. INFO.:			DE 2008-102008036982A	20080808
OTHER SOURCE(S):	MARPAT	152:274903		
GI				

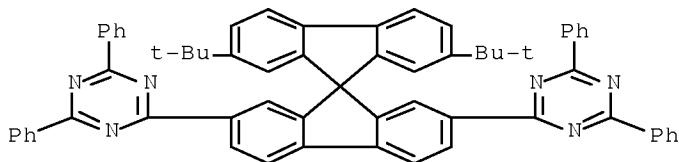


AB      Organic electroluminescent devices are described which include  $\geq 1$  emitting layer comprising a phosphorescent compound (especially a metal complex) and  $\geq 1$  compound are described by the general formula I and II (Ar = independently selected at each occurrence from (un)substituted triazine, pyrazine, pyrimidine, pyridazine, pyrazole, imidazole, oxazole, oxadiazole, or thiazole; X = independently selected at each occurrence III or a bivalent bridge selected from BR1, C(R1)2, Si(R1)2, C:C(R1)2, O, S, S:O, SO2, NR1, PR1, and P(:O)R1; R1 = independently selected at each occurrence from H, D, F, Cl, Br, I, CHO, arylamine, CN, C1-40 alkyl, C1-40 alkoxy, etc., and  $\geq 2$  adjacent R1s can bond to form ring systems; n = 0 or 1; m = 0-3; and o = 0-4 if n = 0 and 0-3 if n = 1). A method for producing the devices including the use of a sublimation or organic vapor deposition method, organic vapor jet printing method, a carrier gas sublimation method, a solution deposition method, or solution printing method to form layers is also described. Use of the compds. as matrix materials in organic electroluminescent devices, mixts. including the compds. and  $\geq 1$  phosphorescent compound, and solns. of the mixts. with an organic solvent are claimed as well.

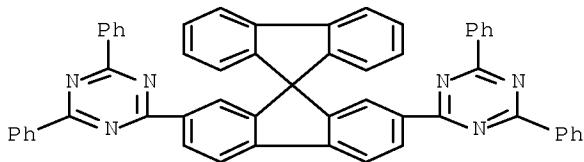
IT      853154-59-3P, 2,7-Bis(4,6-diphenyl-1,3,5-triazin-2-yl)-2',7'-di-tert-butylspiro-9,9'-bifluorene    853154-60-6P,  
 2,7-Bis(4,6-diphenyl-1,3,5-triazin-2-yl)spiro-9,9'-bifluorene  
 1207176-84-8P, 2-(4,6-Diphenyl-1,3,5-triazin-2-yl)spiro-9,9'-bifluorene  
 RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (organic electroluminescent devices with emitting layers using fluorene-like and spirobifluorene-like hosts)

RN      853154-59-3    CAPLUS

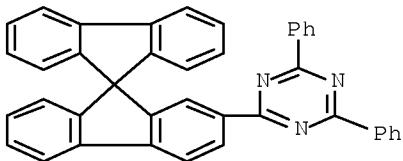
CN      1,3,5-Triazine, 2,2'-[2',7'-bis(1,1-dimethylethyl)-9,9'-spirobi[9H-fluorene]-2,7-diyl]bis[4,6-diphenyl- (9CI)    (CA INDEX NAME)



RN 853154-60-6 CAPLUS  
 CN 1,3,5-Triazine, 2,2'-(9,9'-spirobi[9H-fluorene]-2,7-diyl)bis[4,6-diphenyl- (9CI) (CA INDEX NAME)]



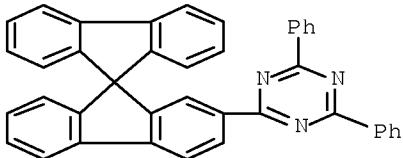
RN 1207176-84-8 CAPLUS  
 CN 1,3,5-Triazine, 2,4-diphenyl-6-(9,9'-spirobi[9H-fluoren]-2-yl)- (CA INDEX NAME)



OS.CITING REF COUNT: 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD  
 (2 CITINGS)  
 REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 7 OF 13 CAPLUS COPYRIGHT 2010 ACS on STN  
 ACCESSION NUMBER: 2010:146936 CAPLUS [Full-text](#)  
 DOCUMENT NUMBER: 152:228678  
 TITLE: Organic electroluminescent device with blue-emitting layer  
 INVENTOR(S): Kaiser, Joachim; Vestweber, Horst; Leu, Simone;  
 Buesing, Arne; Heil, Holger; Stoessel, Philipp  
 PATENT ASSIGNEE(S): Merck Patent G.m.b.H., Germany  
 SOURCE: PCT Int. Appl., 66pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: German  
 FAMILY ACC. NUM. COUNT: 3  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2010012330	A1	20100204	WO 2009-EP3660	20090522
W: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW				
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
DE 102008035413	A1	20100204	DE 2008-102008035413	20080729
PRIORITY APPLN. INFO.: DE 2008-102008035413A 20080729				
OTHER SOURCE(S): MARPAT 152:228678				
AB The present invention relates to white emitting organic electroluminescent devices having at least one blue fluorescent emitter layer containing an aryl or heteroaryl compound as a blue-emitting material. The devices have an improved service life.				
IT 1207176-84-8	RL: TEM (Technical or engineered material use); USES (Uses) (organic electroluminescent device with blue-emitting layer containing aryl or heteroaryl compound for improved service life)			
RN 1207176-84-8	CAPLUS			
CN 1,3,5-Triazine, 2,4-diphenyl-6-(9,9'-spirobi[9H-fluoren]-2-yl)-	(CA INDEX NAME)			



REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 8 OF 13 CAPLUS COPYRIGHT 2010 ACS on STN  
 ACCESSION NUMBER: 2009:1312566 CAPLUS Full-text  
 DOCUMENT NUMBER: 152:86251  
 TITLE: 1,3,5-Triazine derivatives as new electron transport-type host materials for highly efficient green phosphorescent OLEDs  
 AUTHOR(S): Chen, Hsiao-Fan; Yang, Shang-Jung; Tsai, Zhen-Han; Hung, Wen-Yi; Wang, Ting-Chih; Wong, Ken-Tsung  
 CORPORATE SOURCE: Department of Chemistry, National Taiwan University, Taipei, 106, Taiwan  
 SOURCE: Journal of Materials Chemistry (2009), 19(43), 8112-8118  
 CODEN: JMACEP; ISSN: 0959-9428

PUBLISHER: Royal Society of Chemistry  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
OTHER SOURCE(S): CASREACT 152:86251

AB Three star-shaped 1,3,5-triazine derivs., 2,4,6-tris(biphenyl-3-yl)-1,3,5-triazine (T2T), 2,4,6-tris(triphenyl-3-yl)-1,3,5-triazine (T3T), and 2,4,6-tris(9,9'-spirobifluorene-2-yl)-1,3,5-triazine (TST), were synthesized as new electron transport (ET)-type host materials for green phosphorescent organic light-emitting devices. The morphol., thermal, and photophys. properties and the electron mobilities of these ET-type host materials are influenced by the nature of the aryl substituents attached to the triazene core. The meta-meta linkage between the 1,3,5-triazine core and the peripheral aryl moieties in T2T and T3T limited the effective extension of their  $\pi$  conjugation, leading to high triplet energies of 2.80 and 2.69 eV, resp. Time-of-flight mobility measurements revealed the good electron mobilities for (each  $> 10^{-4}$  cm<sup>2</sup> V<sup>-1</sup> s<sup>-1</sup>), following the order T3T  $>$  TST  $>$  T2T. The device incorporating T2T as the host, doped with (PPy)<sub>2</sub>Ir(acac) and 1,3,5-tris(N-phenylbenzimidazol-2-yl)benzene (TBPI) as the ET layer, achieved a high external quantum efficiency ( $\eta_{ext}$ ) of 17.5% and a power efficiency ( $\eta_p$ ) of 59.0 lm W<sup>-1</sup>. For the same device configuration, the T3T-based device provided values of  $\eta_{ext}$  and  $\eta_p$  of 14.4% and 50.6 lm W<sup>-1</sup>, resp.; the TST-based device provided values of 5.1% and 12.3 lm W<sup>-1</sup>, resp. The superior performance of the T2T-based devices is ascribed to balanced charge recombination; the poor efficiencies of the TST-based devices are ascribed to its relatively low triplet energy (2.54 eV), which did not allow efficient confinement of the triplet excitons on the green phosphorescent emitter (PPy)<sub>2</sub>Ir(acac).

IT 1201800-85-2P, 2,4,6-Tris(9,9'-spirobifluorene-2-yl)-1,3,5-triazine

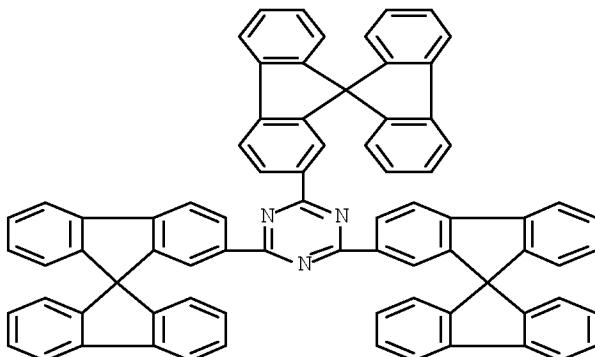
RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(preparation and use as new electron transport-type host material for highly

efficient green phosphorescent organic LEDs)

RN 1201800-85-2 CAPLUS

CN 1,3,5-Triazine, 2-(9,9'-spirobi[9H-fluoren]-2-yl)-4,6-bis(9,9'-spirobi[9H-fluoren]-3-yl)- (CA INDEX NAME)



OS.CITING REF COUNT: 5 THERE ARE 5 CAPLUS RECORDS THAT CITE THIS RECORD (5 CITINGS)  
REFERENCE COUNT: 47 THERE ARE 47 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

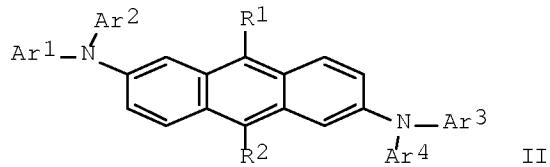
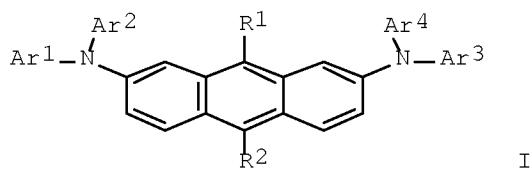
L4 ANSWER 9 OF 13 CAPLUS COPYRIGHT 2010 ACS on STN  
 ACCESSION NUMBER: 2009:1073520 CAPLUS Full-text  
 DOCUMENT NUMBER: 151:300937  
 TITLE: Novel organic electroluminescent compounds based on anthracene derivatives and organic electroluminescent devices and solar cells using the same  
 INVENTOR(S): Kim, Gi Sik; Cho, Yeong Jun; Kwon, Hyuck Ju; Kim, Bong Ok; Kim, Seong Min; Yoon, Seung Su  
 PATENT ASSIGNEE(S): Gracel Display, Inc., S. Korea  
 SOURCE: Eur. Pat. Appl., 356pp.  
 CODEN: EPXXDW  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 2096108	A1	20090902	EP 2009-250537	20090227
R: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LI, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR, AL, BA, RS				
KR 2009093690	A	20090902	KR 2008-19367	20080229
US 20090256468	A1	20091015	US 2009-380544	20090227
JP 2009215559	A	20090924	JP 2009-83395	20090302
CN 101613316	A	20091230	CN 2009-10203961	20090302
PRIORITY APPLN. INFO.:			KR 2008-19367	A 20080229

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

OTHER SOURCE(S): MARPAT 151:300937

GI



AB The present invention relates to novel organic electroluminescent compds., and organic electroluminescent devices employing the same in an electroluminescent layer. Organic electroluminescent compds. are described by the general formula I and II (R1 and R2 = independently selected H, D, C1-60 alkyl, C2-60 alkenyl, C2-60 alkynyl, C3-60 cycloalkyl, C4-60 tricycloalkyl, C7-60 bicycloalkyl, C6-60 aryl, C4-60 heteroaryl, 5- or 6-membered heterocycloalkyl containing  $\geq 1$  of N, O and S, spirobifluorenyl, halo, cyano, C1-60 alkoxy, tri(C1-60 alkyl)silyl, di(C1-60 alkyl)(C6-60 aryl)silyl, or tri(C6-60 aryl)silyl, where the alkyl, alkenyl, alkynyl, cycloalkyl, tricycloalkyl, bicycloalkyl, aryl, or heteroaryl groups may be further substituted by  $\geq 1$  of

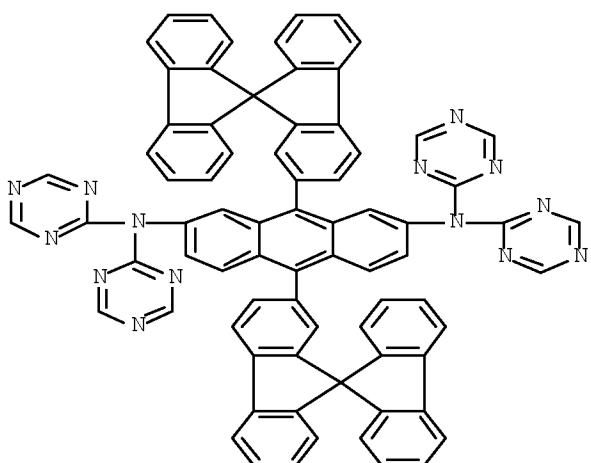
D, C1-60 alkyl, C1-60 alkoxy, halo, tri(C1-60 alkyl)silyl, di(C1-60 alkyl)(C6-60 aryl)silyl, tri(C6-60 aryl)silyl, cyano, C6-60 aryl, (C6-60)ar(C1-60)alkyl, and (C6-60)ar(C1-60)alkoxy; and Ar1-4 = independently selected 5- or 6-membered heteroaryls containing 1-4 heteroatom(s) selected from N, O and S, with the restriction that  $\geq 2$  of Ar1-4 represent pyridyl if a heteroaryl of Ar1-4 represents pyridyl). Organic electroluminescent devices and organic solar cells incorporating the compds. are also described. 3-Aminopyridine.

IT 1185929-77-4 1185929-87-6 1185930-00-0  
 1185930-09-9 1185930-17-9 1185930-23-7  
 1185930-28-2 1185930-32-8 1185930-35-1  
 1185930-37-3 1185930-38-4 1185943-39-8  
 1185943-49-0 1185943-58-1 1185943-66-1  
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 1185943-94-5

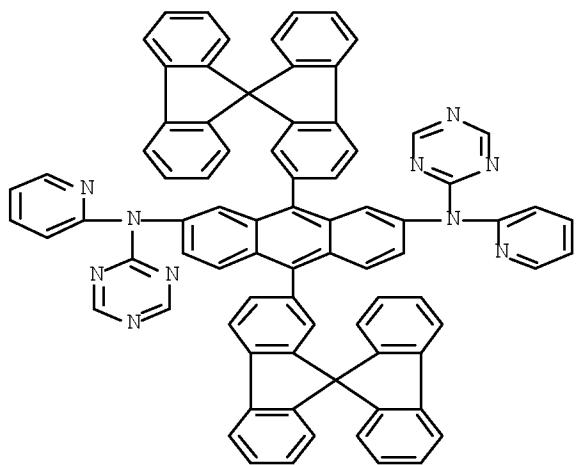
RL: MOA (Modifier or additive use); PRPH (Prophetic); TEM (Technical or engineered material use); USES (Uses)

(organic electroluminescent compds. based on anthracene derivs. and organic electroluminescent devices and solar cells using them)

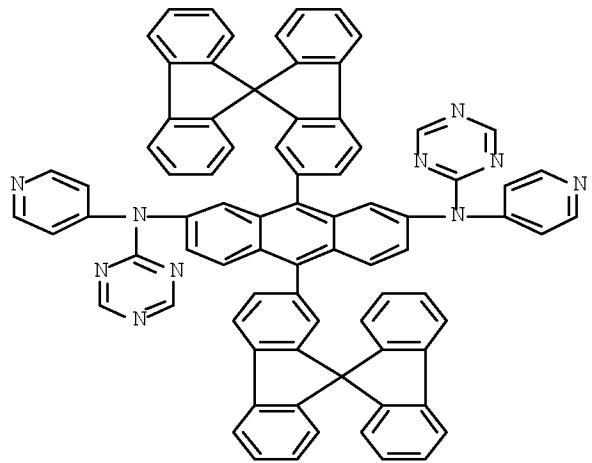
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 CN INDEX NAME NOT YET ASSIGNED



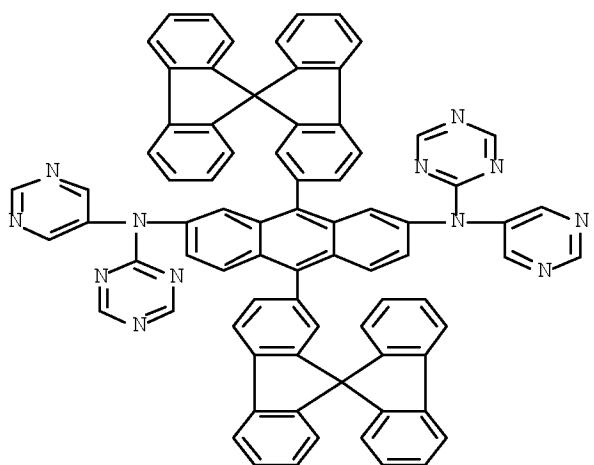
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 CN INDEX NAME NOT YET ASSIGNED



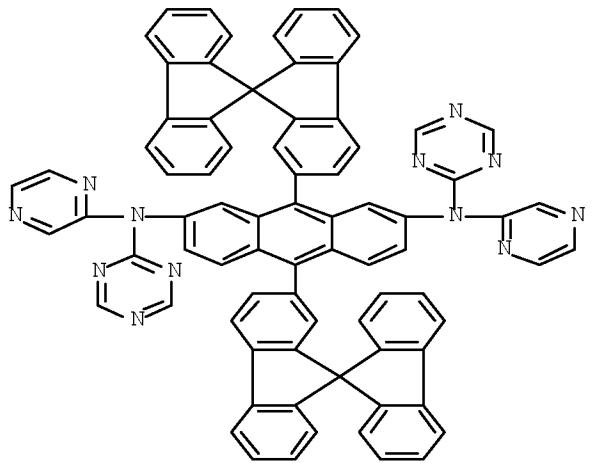
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CN INDEX NAME NOT YET ASSIGNED



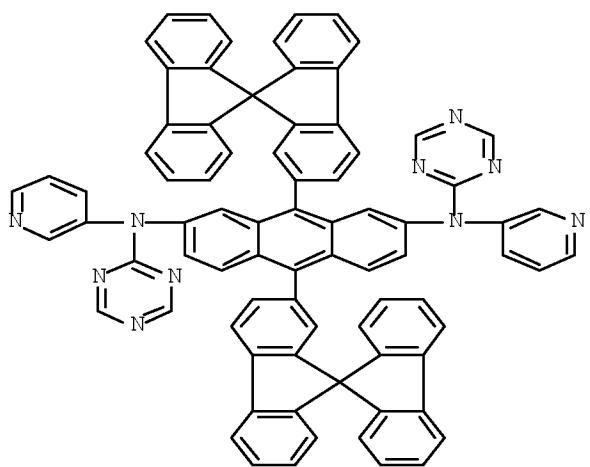
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CN INDEX NAME NOT YET ASSIGNED



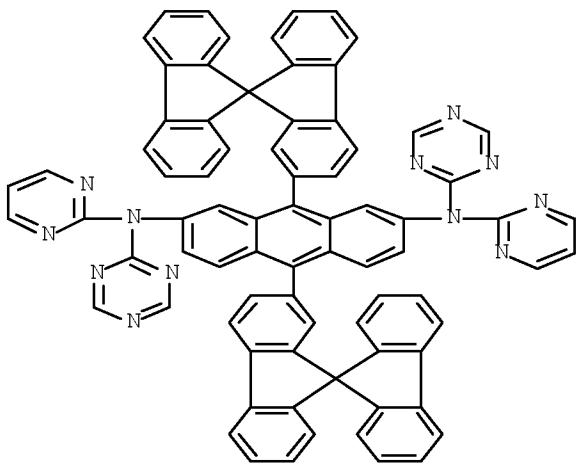
RN 1185930-17-9 CAPLUS  
CN INDEX NAME NOT YET ASSIGNED



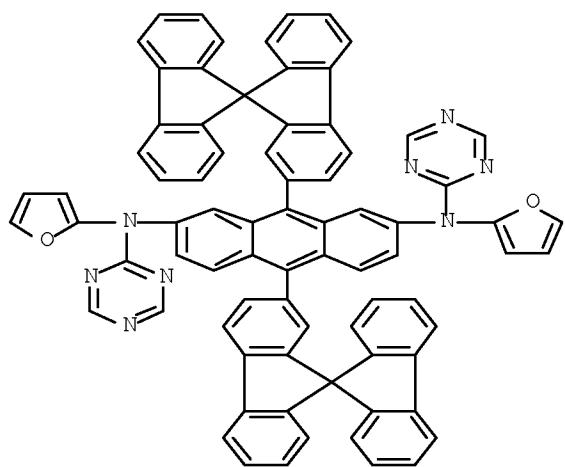
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CN INDEX NAME NOT YET ASSIGNED



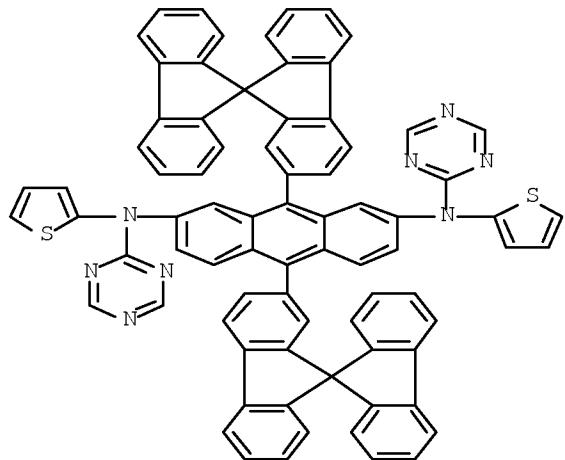
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CN INDEX NAME NOT YET ASSIGNED



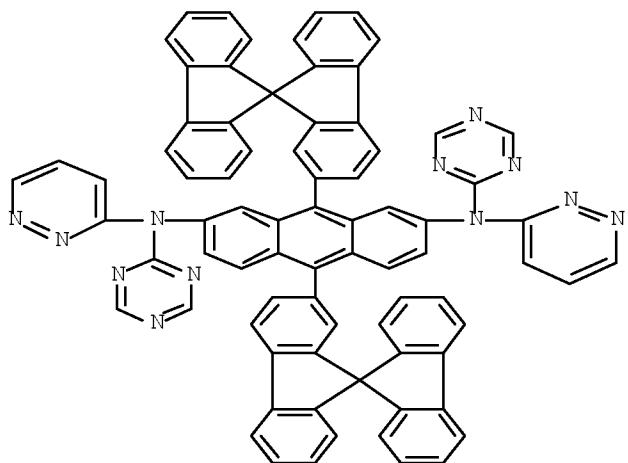
RN 1185930-32-8 CAPLUS  
CN INDEX NAME NOT YET ASSIGNED



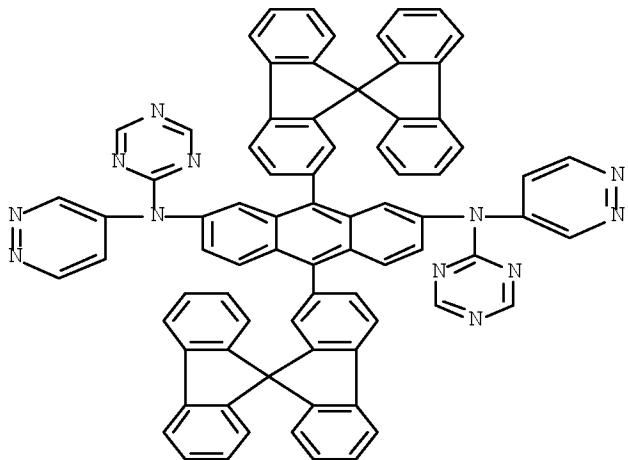
RN 1185930-35-1 CAPLUS  
CN INDEX NAME NOT YET ASSIGNED



RN 1185930-37-3 CAPLUS  
CN INDEX NAME NOT YET ASSIGNED

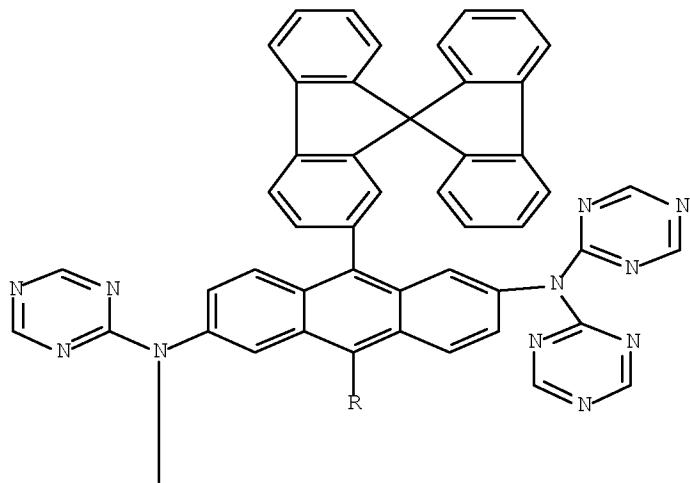


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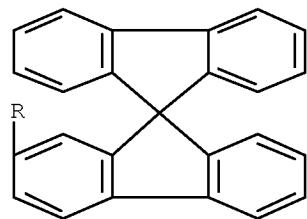
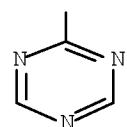


RN 1185943-39-8 CAPLUS  
CN INDEX NAME NOT YET ASSIGNED

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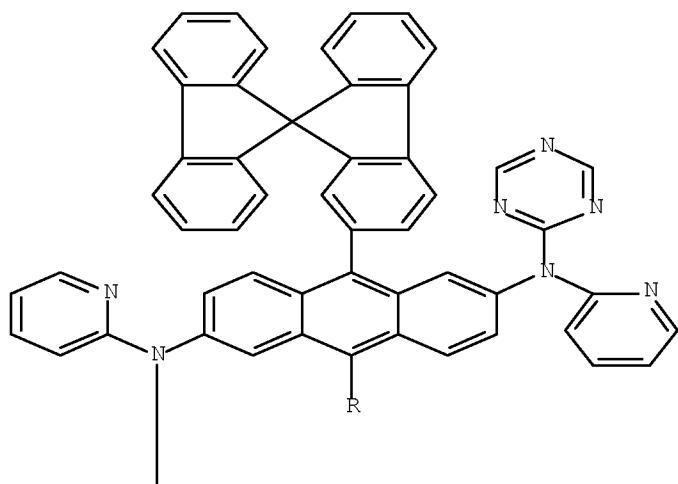


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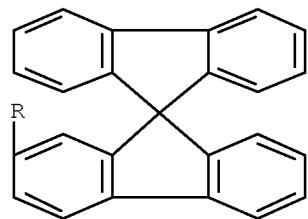
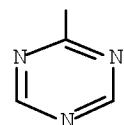


RN 1185943-49-0 CAPLUS  
CN INDEX NAME NOT YET ASSIGNED

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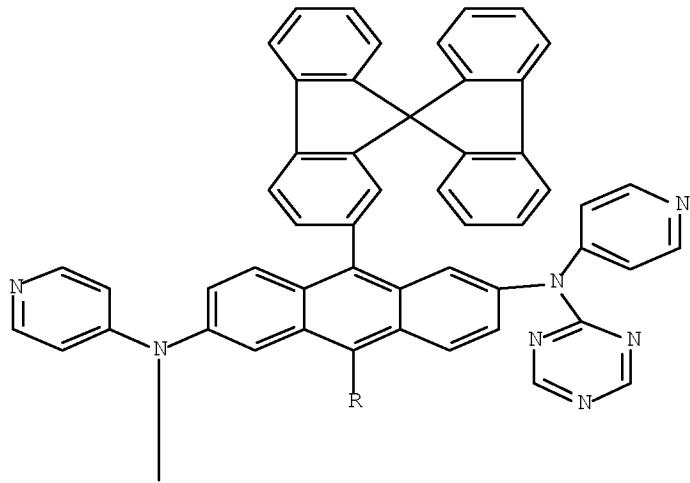


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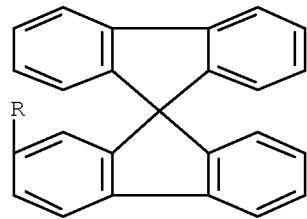
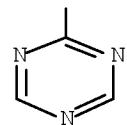


RN 1185943-58-1 CAPLUS  
CN INDEX NAME NOT YET ASSIGNED

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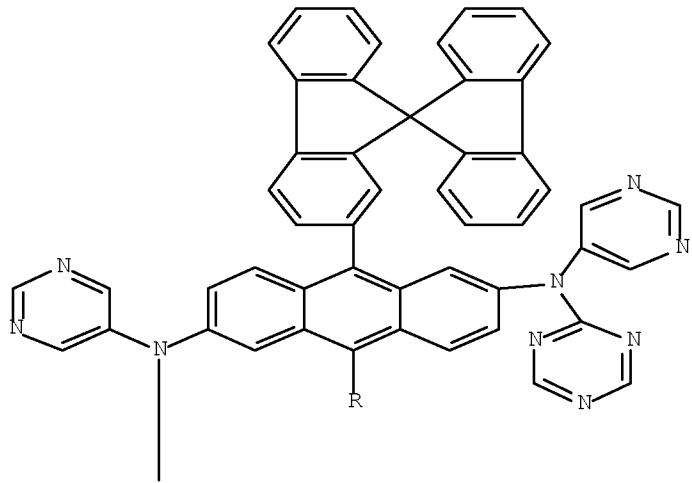


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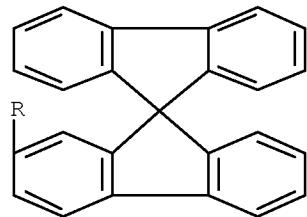
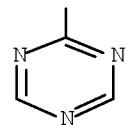


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CN INDEX NAME NOT YET ASSIGNED

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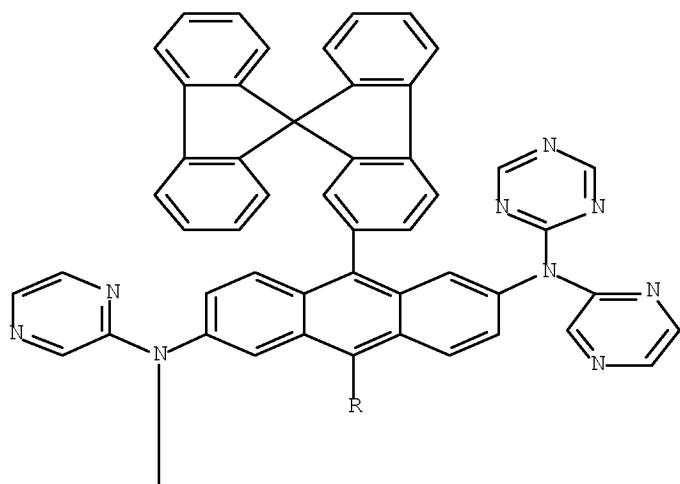


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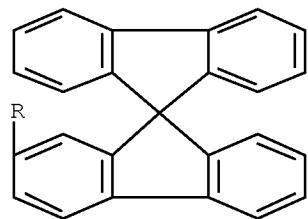
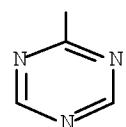


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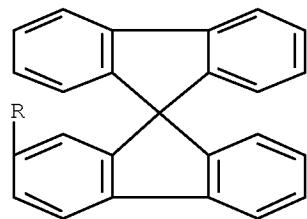
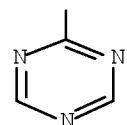
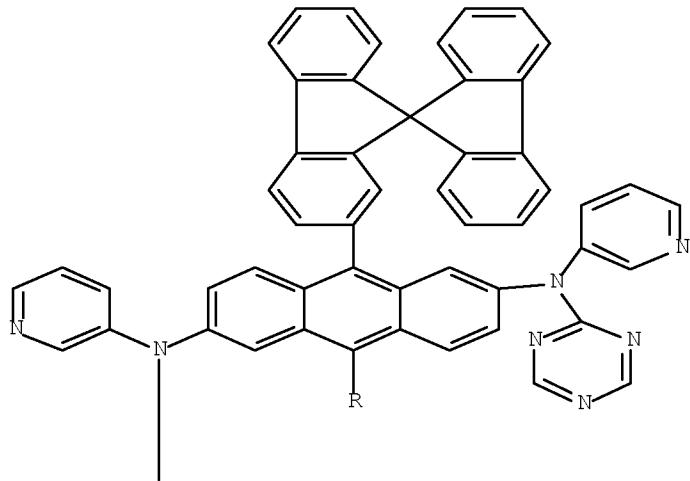
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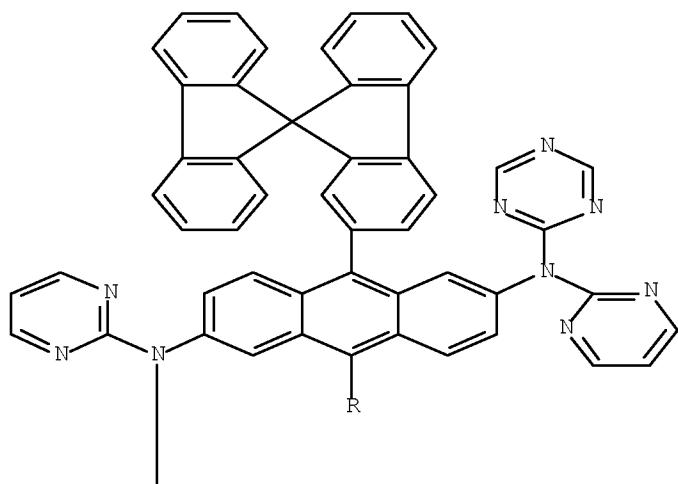


RN 1185943-79-6 CAPLUS  
CN INDEX NAME NOT YET ASSIGNED

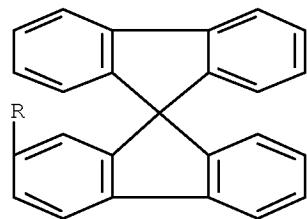
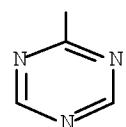


RN 1185943-84-3 CAPLUS  
CN INDEX NAME NOT YET ASSIGNED

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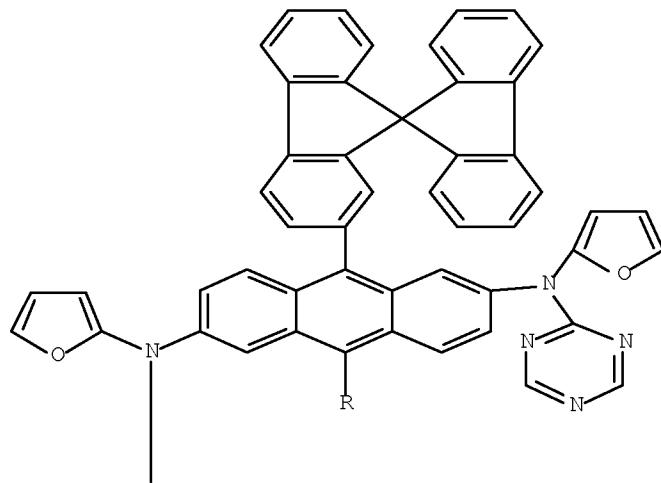


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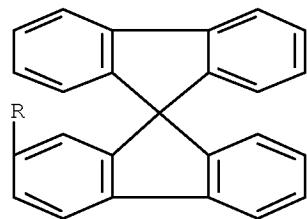
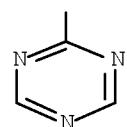


RN 1185943-88-7 CAPLUS  
CN INDEX NAME NOT YET ASSIGNED

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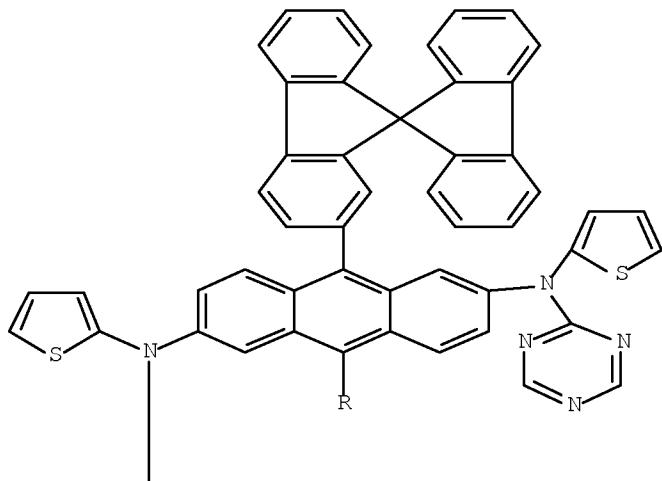


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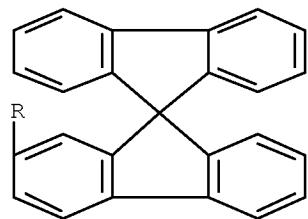
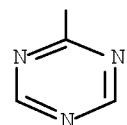


RN 1185943-91-2 CAPLUS  
CN INDEX NAME NOT YET ASSIGNED

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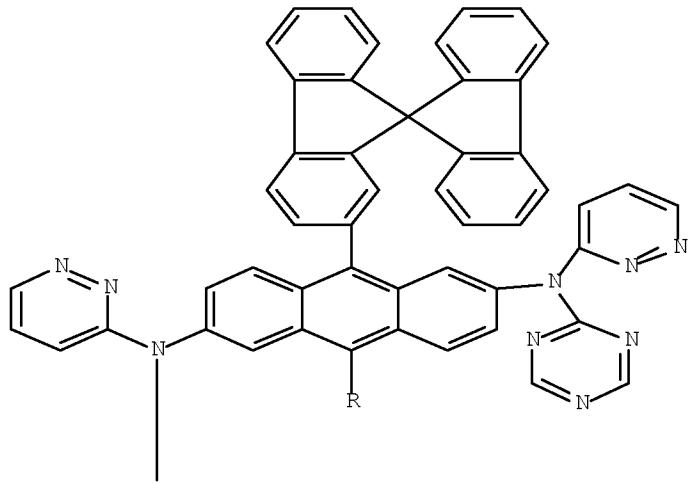


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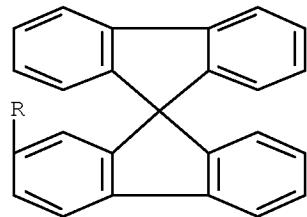
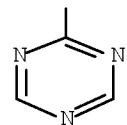


RN 1185943-93-4 CAPLUS  
CN INDEX NAME NOT YET ASSIGNED

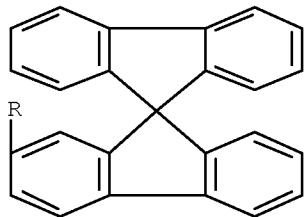
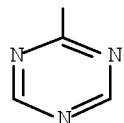
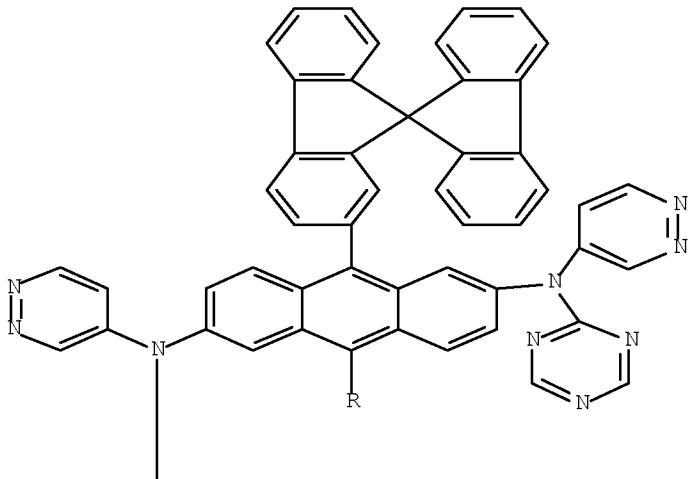
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RN 1185943-94-5 CAPLUS  
CN INDEX NAME NOT YET ASSIGNED



REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 10 OF 13 CAPLUS COPYRIGHT 2010 ACS on STN  
ACCESSION NUMBER: 2009:791541 CAPLUS Full-text  
DOCUMENT NUMBER: 151:111416  
TITLE: Novel organic electroluminescent compounds and organic  
electroluminescent device using the same  
INVENTOR(S): Eum, Sung Jin; Cho, Young Jun; Kwon, Hyuck Joo; Kim,  
Bong Ok; Kim, Sung Min; Yoon, Seung Soo  
PATENT ASSIGNEE(S): Gracel Display Inc., S. Korea  
SOURCE: Eur. Pat. Appl., 263 pp.  
CODEN: EPXXDW  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 2075309	A2	20090701	EP 2008-254194	20081231
EP 2075309	A3	20090923		
R: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LI, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR, AL, BA, MK, RS				
KR 2009073925	A	20090703	KR 2007-142000	20071231
KR 974562	B1	20100806		
JP 2009215281	A	20090924	JP 2008-336315	20081226
CN 101508649	A	20090819	CN 2008-10107489	20081231
US 20100019657	A1	20100128	US 2008-319126	20081231
PRIORITY APPLN. INFO.:				KR 2007-142000 A 20071231

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

OTHER SOURCE(S): MARPAT 151:111416

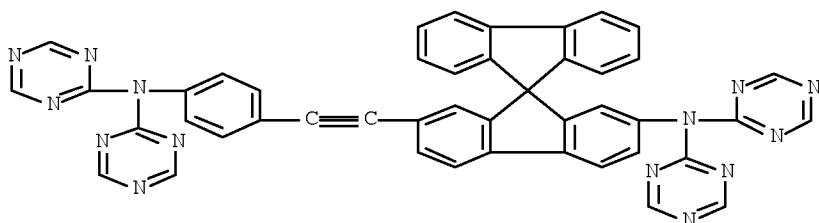
AB Organic electroluminescent compds. are described by the general formula (Ar5)(Ar6)-Ar1-C.tplbond.C-Ar2-N(Ar3)(Ar4) (Ar1 and Ar2 = independently selected C6-60 arylene or C5-60 heteroarylene which may be further substituted by one or more substituent(s) selected from deuterium, linear or branched C1-60 alkyl and C6-60 aryl; Ar3-6 = independently selected linear or branched C1-60 alkyl, C3-60 cycloalkyl, 5- or 6-membered heterocycloalkyl containing one or more heteroatom(s) selected from N, O, and S, C6-60 aryl or C3-60 heteroaryl; Ar3 and Ar5, or Ar6 and Ar7, may be linked via C3-60 alkylene or C3-60 alkenylene with or without a fused ring to form an alicyclic ring, or a monocyclic or polycyclic aromatic ring; and the aryl or heteroaryl of Ar3-6 may be further substituted by one or more substituent(s) selected from deuterium, C6-60 aryl with or without linear or branched C1-60 alkyl or C6-60 aryl substituents, linear or branched C1-60 alkyl with or without halogen substituent(s), C1-30 alkoxy, C3-60 cycloalkyl, halo, cyano, tri(C1-30)alkylsilyl, di(C1-30)alkyl(C6-30)arylsilyl, and tri(C6-30)arylsilyl). Organic electroluminescent devices, including display devices, and organic solar cells employing the materials are also described.

IT 1167631-63-1

RL: MOA (Modifier or additive use); PRPH (Prophetic); TEM (Technical or engineered material use); USES (Uses)  
(electroluminescent di(triarylamine)ethyne derivs. and organic electroluminescent devices and solar cells using them)

RN 1167631-63-1 CAPLUS

CN INDEX NAME NOT YET ASSIGNED



TITLE: Organic electroluminescent element hole-blocking layers with six-membered ring unit-containing compounds and spirobifluorene derivatives and electronic devices using them  
 INVENTOR(S): Vestweber, Horst; Gerhard, Anja; Stoessel, Philipp  
 PATENT ASSIGNEE(S): Covion Organic Semiconductors G.m.b.H., Germany  
 SOURCE: PCT Int. Appl., 38 pp.  
 DOCUMENT TYPE: Patent  
 LANGUAGE: German  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2005053055	A1	20050609	WO 2004-EP13314	20041124
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
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DE 10356099	A1	20050707	DE 2003-10356099	20031127
EP 1687857	A1	20060809	EP 2004-803245	20041124
EP 1687857	B1	20090909		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, PL, SK, IS				
CN 1954446	A	20070425	CN 2004-80035289	20041124
JP 2007520875	T	20070726	JP 2006-540365	20041124
AT 442675	T	20090915	AT 2004-803245	20041124
US 20070051944	A1	20070308	US 2006-580491	20060523
KR 2006122874	A	20061130	KR 2006-710343	20060526
PRIORITY APPLN. INFO.:			DE 2003-10356099	A 20031127
			WO 2004-EP13314	W 20041124

#### ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

OTHER SOURCE(S): MARPAT 143:34908

AB Organic electroluminescent devices comprising an anode, a cathode, and  $\geq 1$  emitting layer, which consists of a matrix material which is doped with  $\geq 1$  phosphorescent emitter, are described which employ compds. including units based on six-membered rings formed from C and/or N atoms, especially triazines, pyrimidines, pyridazines, and pyrazines, as materials for a hole-blocking layer between the emitting layer and the cathode. Compds., which may be employed in the devices, are described which comprise spirobifluorene derivs. with  $\geq 1$  triazine unit bonded to them, optionally along with other six-membered ring-containing substituents. The use of the design of the electroluminescent devices in other electronic devices, including organic transistors, organic integrated circuits, organic solar cells, organic laser diodes, or photoreceptors, is also described. Organic transistors, organic integrated circuits, organic solar cells, organic laser diodes, or photoreceptors.

IT 853154-59-3P 853154-60-6P

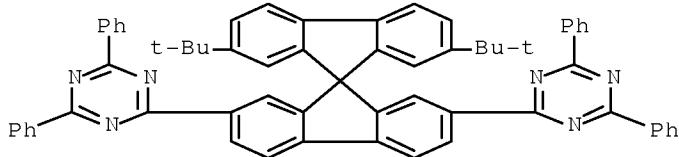
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)

(organic electroluminescent element with hole-blocking layers formed from

compds. including six-membered rings and spirobifluorene derivs. and electronic devices using them)

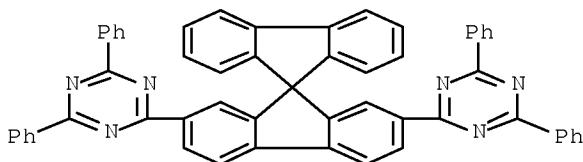
RN 853154-59-3 CAPLUS

CN 1,3,5-Triazine, 2,2'-(2',7'-bis(1,1-dimethylethyl)-9,9'-spirobi[9H-fluorene]-2,7-diyl)bis[4,6-diphenyl- (9CI) (CA INDEX NAME)



RN 853154-60-6 CAPLUS

CN 1,3,5-Triazine, 2,2'-(9,9'-spirobi[9H-fluorene]-2,7-diyl)bis[4,6-diphenyl- (9CI) (CA INDEX NAME)



OS.CITING REF COUNT: 4 THERE ARE 4 CAPLUS RECORDS THAT CITE THIS RECORD  
(9 CITINGS)

REFERENCE COUNT: 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 12 OF 13 CAPLUS COPYRIGHT 2010 ACS on STN

ACCESSION NUMBER: 2005:273912 CAPLUS [Full-text](#)

DOCUMENT NUMBER: 142:410919

TITLE: Molecular Tectonics. Porous Hydrogen-Bonded Networks  
Built from Derivatives of

2,2',7,7'-Tetraphenyl-9,9'-spirobi[9H-fluorene]

AUTHOR(S): Demers, Eric; Maris, Thierry; Wuest, James D.

CORPORATE SOURCE: Departement de Chimie, Universite de Montreal,  
Montreal, QC, H3C 3J7, Can.

SOURCE: Crystal Growth & Design (2005), 5(3), 1227-1235  
CODEN: CGDEFU; ISSN: 1528-7483

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

GI

\* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT \*

AB The cruciform shape of spirobifluorene disfavors close mol. packing, and more complex derivs. with multiple sites of hydrogen bonding are known to associate to form highly porous networks with significant space for the inclusion of guests. In principle, the porosity can be increased by introducing spacers between the spirobifluorene core and the peripheral sites of association. To test this strategy, compds. 2-3 (I) with multiple diaminotriazine groups attached to a tetraphenylspirobifluorene core were synthesized, and their behavior was compared with that of a model (4) (II) lacking the Ph spacers. As expected, extended spirobifluorenes 2-3 crystallized to produce open networks held together by hydrogen bonding of diaminotriazine groups; however, the porosities of these networks were lower (53% and 44%, resp.) than that of the network built from model 4 (60%). The decreased porosity arises largely because the added Ph spacers change the relative contributions of hydrogen bonding and aromatic interactions to the overall lattice energy of the crystals. It becomes advantageous to optimize aromatic interactions at the expense of hydrogen bonds, and crystallization therefore favors networks that permit closer mol. packing.

IT 850493-07-1P 850493-09-3P

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation) (crystallog.; porous hydrogen-bonded networks built from derivs. of 2,2',7,7'-tetraphenyl-9,9'-spirobi[9H-fluorene])

RN 850493-07-1 CAPLUS

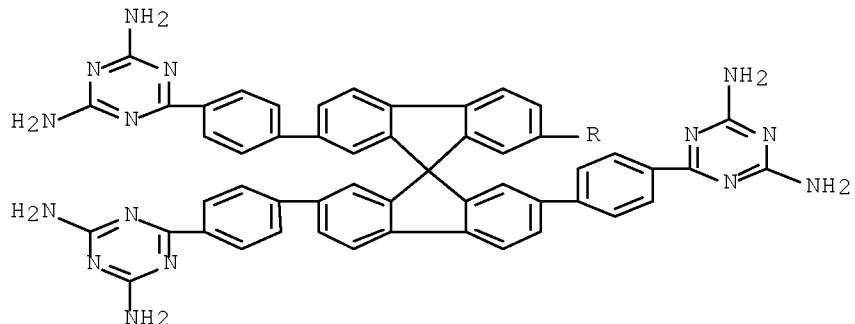
CN 1,3,5-Triazine-2,4-diamine, 6,6',6'',6'''-(9,9'-spirobi[9H-fluorene]-2,2',7,7'-tetrayltetra-4,1-phenylene)tetraakis-, compd. with sulfinylbis[methane], hydrate (2:14:3) (9CI) (CA INDEX NAME)

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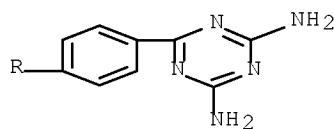
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CMF C61 H44 N20

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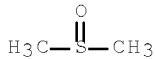


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CMF C2 H6 O S

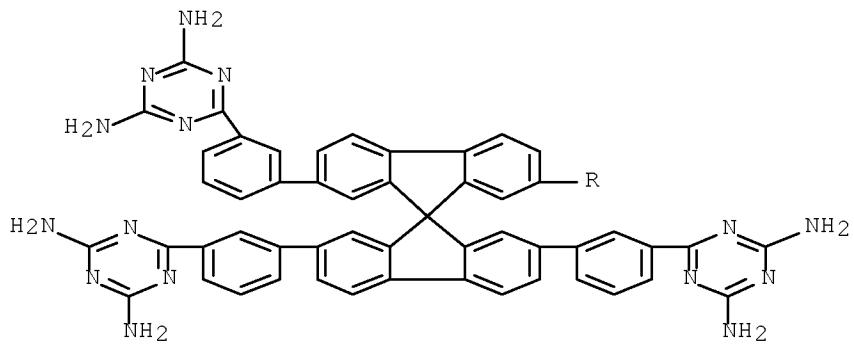


RN 850493-09-3 CAPLUS  
CN 1,3,5-Triazine-2,4-diamine, 6,6',6'',6'''-(9,9'-spirobi[9H-fluorene]-2,2',7,7'-tetrayltetra-3,1-phenylene)tetraakis-, compd. with methanol and sulfinylbis[methane] (2:5:10) (9CI) (CA INDEX NAME)

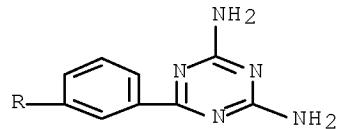
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CMF C61 H44 N20

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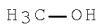
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CRN 67-68-5  
CMF C2 H6 O S



CM 3

CRN 67-56-1  
CMF C H4 O



OS.CITING REF COUNT: 17 THERE ARE 17 CAPLUS RECORDS THAT CITE THIS RECORD (17 CITINGS)  
REFERENCE COUNT: 129 THERE ARE 129 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 13 OF 13 CAPLUS COPYRIGHT 2010 ACS on STN  
ACCESSION NUMBER: 2003:726758 CAPLUS Full-text  
DOCUMENT NUMBER: 140:163418  
TITLE: Molecular Tectonics. Porous Hydrogen-Bonded Networks Built from Derivatives of 9,9'-Spirobifluorene  
AUTHOR(S): Fournier, Jean-Hugues; Maris, Thierry; Wuest, James D.  
CORPORATE SOURCE: Departement de Chimie, Universite de Montreal, Montreal, QC, H3C 3J7, Can.  
SOURCE: Journal of Organic Chemistry (2004), 69(6), 1762-1775  
CODEN: JOCEAH; ISSN: 0022-3263  
PUBLISHER: American Chemical Society  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
OTHER SOURCE(S): CASREACT 140:163418

AB Mols. with multiple sites that induce strong directional association tend to form open networks with significant vols. available for the inclusion of guests. Such mols. can be conveniently synthesized by grafting diverse sticky sites onto geometrically suitable cores. The characteristic inability of 9,9'-spirobifluorene to form close-packed crystals suggests that it should serve as a particularly effective core for the elaboration of mols. designed to form highly porous networks. To test this hypothesis, various new tetrasubstituted 9,9'-spirobifluorenes with hydrogen-bonding sites at the 3,3',6,6'-positions or 2,2',7,7'-positions were synthesized by multistep routes. Four of these compds. were crystallized, and their structures were determined by X-ray crystallog. In all cases, the compds. form extensively hydrogen-bonded networks with high porosity. In particular, 43% of the volume of crystals of 3,3',6,6'-tetrahydroxy-9,9'-spirobifluorene (28) is available for the inclusion of guests, whereas the porosity is only 28% in crystals of tetrakis(4-hydroxyphenyl)methane, a close model that lacks the spirobifluorene core. Similarly, the porosities found in crystals of 2,2',7,7'-tetra(acetamido)-9,9'-spirobifluorene (33) and 2,2',7,7'-tetrasubstituted tetrakis(diaminotriazine) 39 are 33% and 60%, resp. Moreover, the porosity of crystals of 2,2',7,7'-tetrasubstituted tetrakis(triaminotriazine) 40 is 75%, the highest value yet observed in crystals built from small mols. These observations demonstrate that a particularly effective strategy for engineering mols. able to form highly porous networks is to graft multiple

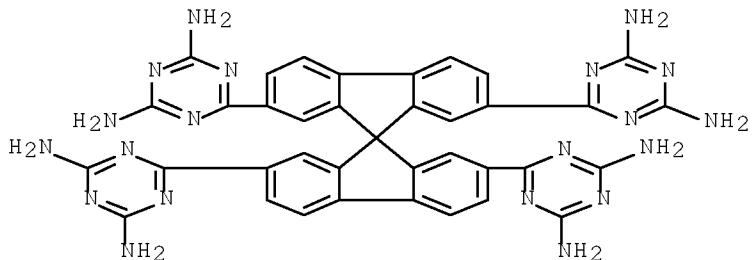
sticky sites onto spirobifluorenes or other cores intrinsically resistant to close packing.

IT 622011-42-1P 622011-43-2P

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(crystal structure; porous hydrogen-bonded networks built from derivs.  
of 9,9'-spirobifluorene)

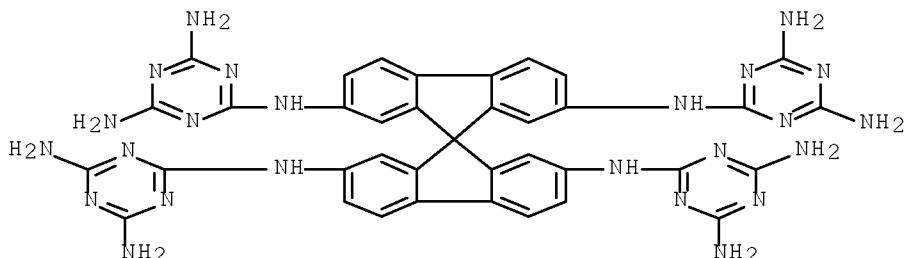
RN 622011-42-1 CAPLUS

CN 1,3,5-Triazine-2,4-diamine, 6,6',6'',6'''-(9,9'-spirobi[9H-fluorene]-  
2,2',7,7'-tetrayl)tetrakis- (9CI) (CA INDEX NAME)



RN 622011-43-2 CAPLUS

CN 9,9'-Spirobi[9H-fluorene]-2,2',7,7'-tetramine,  
N2,N2',N7,N7'-tetrakis(4,6-diamino-1,3,5-triazin-2-yl)- (CA INDEX NAME)

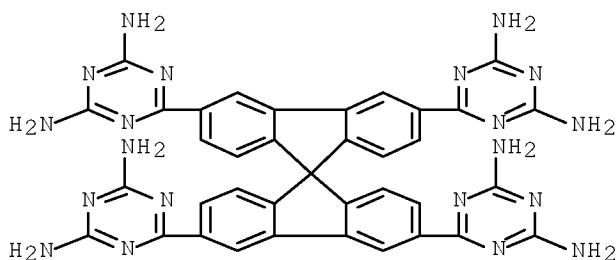


IT 622011-28-3P 622011-29-4P

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(tecton; porous hydrogen-bonded networks built from derivs. of  
9,9'-spirobifluorene)

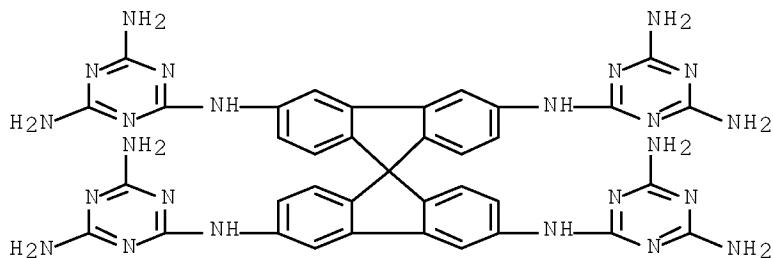
RN 622011-28-3 CAPLUS

CN 1,3,5-Triazine-2,4-diamine, 6,6',6'',6'''-(9,9'-spirobi[9H-fluorene]-  
3,3',6,6'-tetrayl)tetrakis- (9CI) (CA INDEX NAME)



RN 622011-29-4 CAPLUS

CN 9,9'-Spirobi[9H-fluorene]-3,3',6,6'-tetramine,  
N3,N3',N6,N6'-tetrakis(4,6-diamino-1,3,5-triazin-2-yl)- (CA INDEX NAME)



OS.CITING REF COUNT:

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THERE ARE 60 CAPLUS RECORDS THAT CITE THIS RECORD (61 CITINGS)

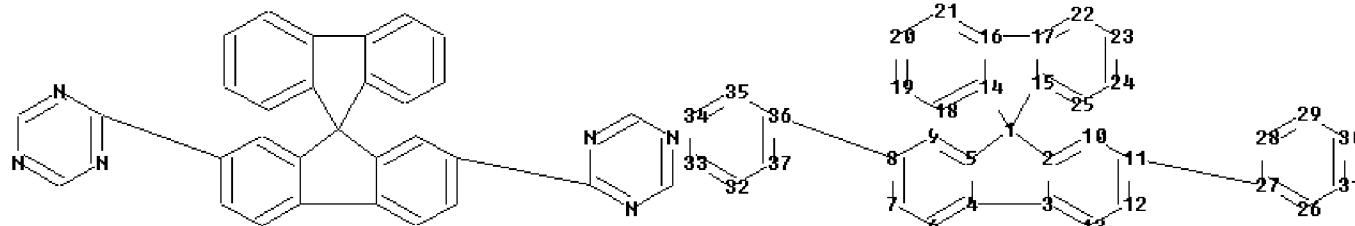
REFERENCE COUNT:

126

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exact bonds :

1-2 1-5 1-14 1-15 3-4 8-36 11-27 16-17

normalized bonds :

2-3 2-10 3-13 4-5 4-6 5-9 6-7 7-8 8-9 10-11 11-12 12-13 14-16 14-18

15-17 15-25 16-21 17-22 18-19 19-20 20-21 22-23 23-24 24-25 26-27 26-31

27-28 28-29

29-30 30-31 32-33 32-37 33-34 34-35 35-36 36-37

isolated ring systems :

containing 1 : 26 : 32 :

Match level :

1:Atom 2:Atom 3:Atom 4:Atom 5:Atom 6:Atom 7:Atom 8:Atom 9:Atom 10:Atom

11:Atom 12:Atom 13:Atom 14:Atom 15:Atom 16:Atom 17:Atom 18:Atom 19:Atom

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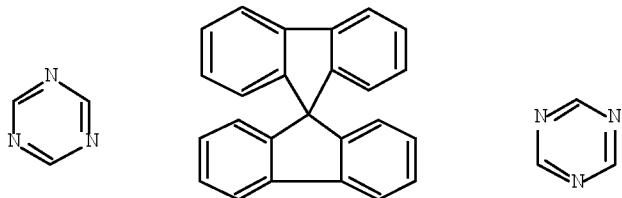
33:Atom 34:Atom 35:Atom 36:Atom 37:Atom

L1 STRUCTURE UPLOADED

=> d 11

L1 HAS NO ANSWERS

L1 STR



Structure attributes must be viewed using STN Express query preparation.

=> s 11

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SAMPLE SCREEN SEARCH COMPLETED - 19 TO ITERATE

100.0% PROCESSED 19 ITERATIONS  
SEARCH TIME: 00.00.01

1 ANSWERS

FULL FILE PROJECTIONS: ONLINE \*\*COMPLETE\*\*

BATCH \*\*COMPLETE\*\*

PROJECTED ITERATIONS: 119 TO 641

PROJECTED ANSWERS: 1 TO 80

L2 1 SEA SSS SAM L1

=> s 11 full

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FULL SCREEN SEARCH COMPLETED -

376 TO ITERATE

100.0% PROCESSED 376 ITERATIONS  
SEARCH TIME: 00.00.01

34 ANSWERS

L3 34 SEA SSS FUL L1

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> s 13

L4 8 L3

=> d ibib abs hitstr 8

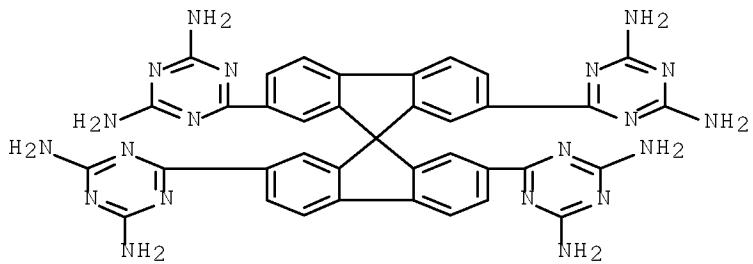
L4 ANSWER 8 OF 8 CAPLUS COPYRIGHT 2011 ACS on STN  
ACCESSION NUMBER: 2003:726758 CAPLUS Full-text  
DOCUMENT NUMBER: 140:163418  
TITLE: Molecular Tectonics. Porous Hydrogen-Bonded Networks  
Built from Derivatives of 9,9'-Spirobifluorene  
AUTHOR(S): Fournier, Jean-Hugues; Maris, Thierry; Wuest, James D.  
CORPORATE SOURCE: Departement de Chimie, Universite de Montreal,  
Montreal, QC, H3C 3J7, Can.  
SOURCE: Journal of Organic Chemistry (2004), 69(6), 1762-1775  
CODEN: JOCEAH; ISSN: 0022-3263  
PUBLISHER: American Chemical Society  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
OTHER SOURCE(S): CASREACT 140:163418  
AB Mols. with multiple sites that induce strong directional association tend to form open networks with significant vols. available for the inclusion of guests. Such mols. can be conveniently synthesized by grafting diverse sticky sites onto geometrically suitable cores. The characteristic inability of 9,9'-spirobifluorene to form close-packed crystals suggests that it should serve as a particularly effective core for the elaboration of mols. designed to form highly porous networks. To test this hypothesis, various new tetrasubstituted 9,9'-spirobifluorenes with hydrogen-bonding sites at the 3,3',6,6'-positions or 2,2',7,7'-positions were synthesized by multistep routes. Four of these compds. were crystallized, and their structures were determined by X-ray crystallog. In all cases, the compds. form extensively hydrogen-bonded networks with high porosity. In particular, 43% of the volume of crystals of 3,3',6,6'-tetrahydroxy-9,9'-spirobifluorene (28) is available for the inclusion of guests, whereas the porosity is only 28% in crystals of tetrakis(4-hydroxyphenyl)methane, a close model that lacks the spirobifluorene core. Similarly, the porosities found in crystals of 2,2',7,7'-tetra(acetamido)-9,9'-spirobifluorene (33) and 2,2',7,7'-tetrasubstituted tetrakis(diaminotriazine) 39 are 33% and 60%, resp. Moreover, the porosity of crystals of 2,2',7,7'-tetrasubstituted tetrakis(triaminotriazine) 40 is 75%, the highest value yet observed in crystals built from small mols. These observations demonstrate that a particularly effective strategy for engineering mols. able to form highly porous networks is to graft multiple sticky sites onto spirobifluorenes or other cores intrinsically resistant to close packing.

IT 622011-42-1P 622011-43-2P

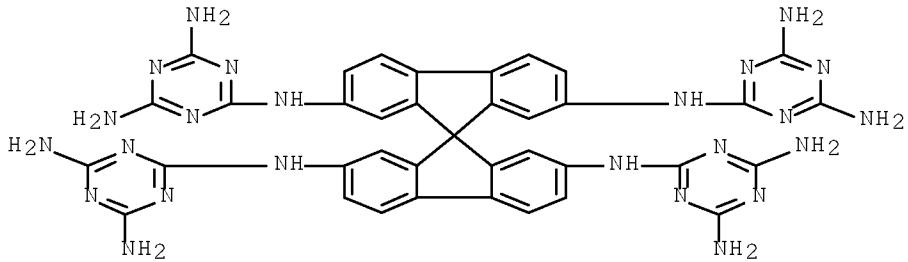
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(crystal structure; porous hydrogen-bonded networks built from derivs.  
of 9,9'-spirobifluorene)

RN 622011-42-1 CAPLUS

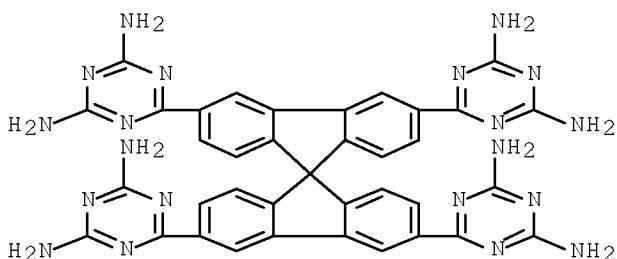
CN 1,3,5-Triazine-2,4-diamine, 6,6',6'',6'''-(9,9'-spirobi[9H-fluorene]-  
2,2',7,7'-tetrayl)tetrakis- (9CI) (CA INDEX NAME)



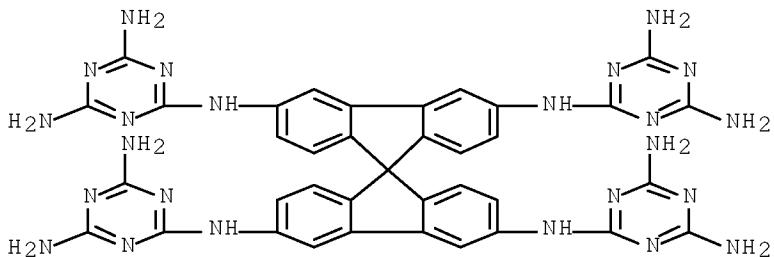
RN 622011-43-2 CAPLUS  
 CN 9,9'-Spirobi[9H-fluorene]-2,2',7,7'-tetramine,  
 N2,N2',N7,N7'-tetrakis(4,6-diamino-1,3,5-triazin-2-yl)- (CA INDEX NAME)



IT 622011-28-3P 622011-29-4P  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (tector; porous hydrogen-bonded networks built from derivs. of  
 9,9'-spirobifluorene)  
 RN 622011-28-3 CAPLUS  
 CN 1,3,5-Triazine-2,4-diamine, 6,6',6'',6'''-(9,9'-spirobi[9H-fluorene]-  
 3,3',6,6'-tetrayl)tetraakis- (9CI) (CA INDEX NAME)



RN 622011-29-4 CAPLUS  
 CN 9,9'-Spirobi[9H-fluorene]-3,3',6,6'-tetramine,  
 N3,N3',N6,N6'-tetrakis(4,6-diamino-1,3,5-triazin-2-yl)- (CA INDEX NAME)



OS.CITING REF COUNT: 64 THERE ARE 64 CAPLUS RECORDS THAT CITE THIS RECORD (65 CITINGS)  
 REFERENCE COUNT: 126 THERE ARE 126 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

=> d ibib abs hitstr 7

L4 ANSWER 7 OF 8 CAPLUS COPYRIGHT 2011 ACS on STN  
 ACCESSION NUMBER: 2005:273912 CAPLUS [Full-text](#)  
 DOCUMENT NUMBER: 142:410919  
 TITLE: Molecular Tectonics. Porous Hydrogen-Bonded Networks Built from Derivatives of 2,2',7,7'-Tetraphenyl-9,9'-spirobi[9H-fluorene]  
 AUTHOR(S): Demers, Eric; Maris, Thierry; Wuest, James D.  
 CORPORATE SOURCE: Departement de Chimie, Universite de Montreal, Montreal, QC, H3C 3J7, Can.  
 SOURCE: Crystal Growth & Design (2005), 5(3), 1227-1235  
 CODEN: CGDEFU; ISSN: 1528-7483  
 PUBLISHER: American Chemical Society  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 GI

\* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT \*

AB The cruciform shape of spirobifluorene disfavors close mol. packing, and more complex derivs. with multiple sites of hydrogen bonding are known to associate to form highly porous networks with significant space for the inclusion of guests. In principle, the porosity can be increased by introducing spacers between the spirobifluorene core and the peripheral sites of association. To test this strategy, compds. 2-3 (I) with multiple diaminotriazine groups attached to a tetraphenylspirobifluorene core were synthesized, and their behavior was compared with that of a model (4) (II) lacking the Ph spacers. As expected, extended spirobifluorenes 2-3 crystallized to produce open networks held together by hydrogen bonding of diaminotriazine groups; however, the porosities of these networks were lower (53% and 44%, resp.) than that of the network built from model 4 (60%). The decreased porosity arises largely because the added Ph spacers change the relative contributions of hydrogen bonding and aromatic interactions to the overall lattice energy of the

crystals. It becomes advantageous to optimize aromatic interactions at the expense of hydrogen bonds, and crystallization therefore favors networks that permit closer mol. packing.

IT 850493-07-1P 850493-09-3P

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation) (crystallog.; porous hydrogen-bonded networks built from derivs. of 2,2',7,7'-tetraphenyl-9,9'-spirobi[9H-fluorene])

RN 850493-07-1 CAPLUS

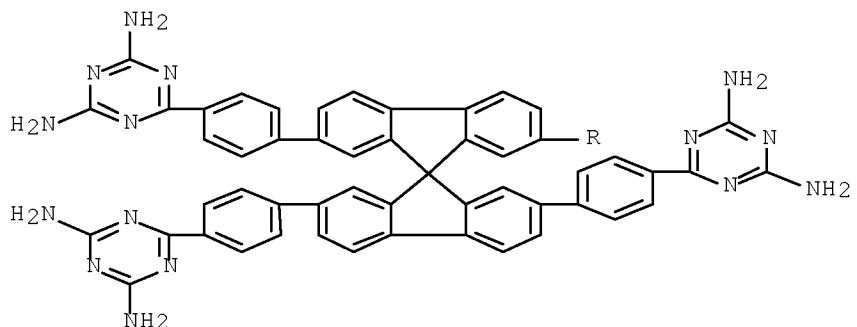
CN 1,3,5-Triazine-2,4-diamine, 6,6',6'',6'''-(9,9'-spirobi[9H-fluorene]-2,2',7,7'-tetrayltetra-4,1-phenylene)tratrakis-, compd. with sulfinylbis[methane], hydrate (2:14:3) (9CI) (CA INDEX NAME)

CM 1

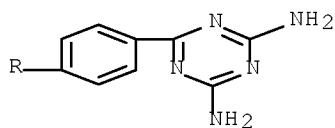
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CMF C61 H44 N20

PAGE 1-A



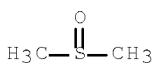
PAGE 2-A



CM 2

CRN 67-68-5

CMF C2 H6 O S



RN 850493-09-3 CAPLUS

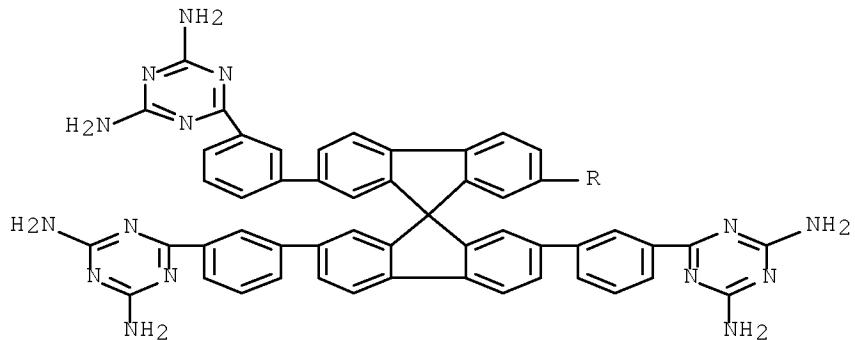
CN 1,3,5-Triazine-2,4-diamine, 6,6',6'',6'''-(9,9'-spirobi[9H-fluorene]-

2,2',7,7'-tetrayltetra-3,1-phenylene)tetraakis-, compd. with methanol and sulfinylbis[methane] (2:5:10) (9CI) (CA INDEX NAME)

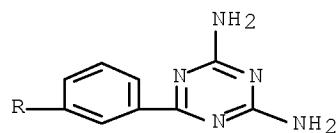
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CRN 850493-08-2  
CMF C61 H44 N20

PAGE 1-A



PAGE 2-A



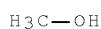
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CRN 67-68-5  
CMF C2 H6 O S



CM 3

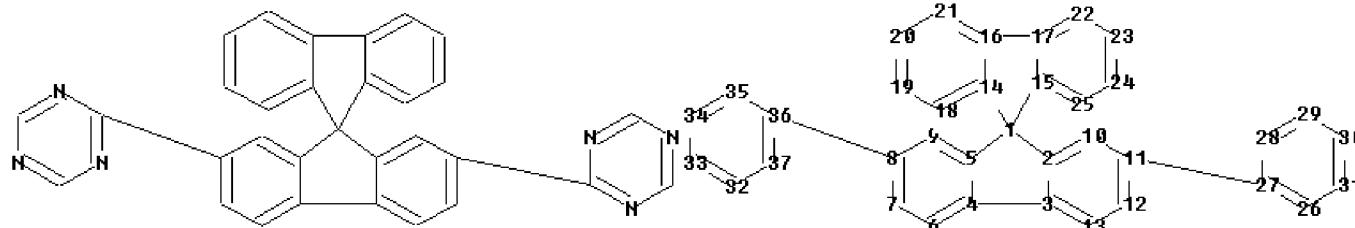
CRN 67-56-1  
CMF C H4 O



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 REFERENCE COUNT: 129 THERE ARE 129 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

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ring nodes :

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 24 25 26 27 28 29 30 31 32 33 34 35 36 37

chain bonds :

8-36 11-27

ring bonds :

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 11-12 12-13 14-16 14-18 15-17 15-25 16-17 16-21 17-22 18-19 19-20 20-21  
 22-23 23-24 24-25  
 26-27 26-31 27-28 28-29 29-30 30-31 32-33 32-37 33-34 34-35 35-36 36-37

exact bonds :

1-2 1-5 1-14 1-15 3-4 8-36 11-27 16-17

normalized bonds :

2-3 2-10 3-13 4-5 4-6 5-9 6-7 7-8 8-9 10-11 11-12 12-13 14-16 14-18  
 15-17 15-25 16-21 17-22 18-19 19-20 20-21 22-23 23-24 24-25 26-27 26-31  
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isolated ring systems :

containing 1 : 26 : 32 :

Match level :

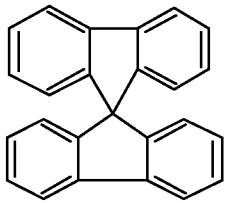
1:Atom 2:Atom 3:Atom 4:Atom 5:Atom 6:Atom 7:Atom 8:Atom 9:Atom 10:Atom  
 11:Atom 12:Atom 13:Atom 14:Atom 15:Atom 16:Atom 17:Atom 18:Atom 19:Atom  
 20:Atom 21:Atom  
 22:Atom 23:Atom 24:Atom 25:Atom 26:Atom 27:Atom 28:Atom 29:Atom 30:Atom  
 31:Atom 32:Atom  
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L5 STRUCTURE UPLOADED

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L5 HAS NO ANSWERS

L5 STR



Structure attributes must be viewed using STN Express query preparation.

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100.0% PROCESSED 19 ITERATIONS 2 ANSWERS
SEARCH TIME: 00.00.01

FULL FILE PROJECTIONS: ONLINE **COMPLETE**
BATCH **COMPLETE**
PROJECTED ITERATIONS: 119 TO 641
PROJECTED ANSWERS: 2 TO 124

L6 2 SEA SSS SAM L5

=> s 15 full
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100.0% PROCESSED 282 ITERATIONS 42 ANSWERS
SEARCH TIME: 00.00.01

L7 42 SEA SSS FUL L5

=> s 17
L8 21 L7

=> s 18 and electrolumin?
113772 ELECTROLUMIN?
L9 19 L8 AND ELECTROLUMIN?

=> d ibib abs hitstr 16-19

L9 ANSWER 16 OF 19 CAPLUS COPYRIGHT 2011 ACS on STN
ACCESSION NUMBER: 2009:1312566 CAPLUS Full-text
DOCUMENT NUMBER: 152:86251
TITLE: 1,3,5-Triazine derivatives as new electron
transport-type host materials for highly efficient
green phosphorescent OLEDs
AUTHOR(S): Chen, Hsiao-Fan; Yang, Shang-Jung; Tsai, Zhen-Han;
Hung, Wen-Yi; Wang, Ting-Chih; Wong, Ken-Tsung
CORPORATE SOURCE: Department of Chemistry, National Taiwan University,
Taipei, 106, Taiwan
SOURCE: Journal of Materials Chemistry (2009), 19(43),
8112-8118
```

CODEN: JMACEP; ISSN: 0959-9428

PUBLISHER: Royal Society of Chemistry  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
OTHER SOURCE(S): CASREACT 152:86251

AB Three star-shaped 1,3,5-triazine derivs., 2,4,6-tris(biphenyl-3-yl)-1,3,5-triazine (T2T), 2,4,6-tris(triphenyl-3-yl)-1,3,5-triazine (T3T), and 2,4,6-tris(9,9'-spirobifluorene-2-yl)-1,3,5-triazine (TST), were synthesized as new electron transport (ET)-type host materials for green phosphorescent organic light-emitting devices. The morphol., thermal, and photophys. properties and the electron mobilities of these ET-type host materials are influenced by the nature of the aryl substituents attached to the triazene core. The meta-meta linkage between the 1,3,5-triazine core and the peripheral aryl moieties in T2T and T3T limited the effective extension of their  $\pi$  conjugation, leading to high triplet energies of 2.80 and 2.69 eV, resp. Time-of-flight mobility measurements revealed the good electron mobilities for (each  $> 10^{-4}$  cm<sup>2</sup> V<sup>-1</sup> s<sup>-1</sup>), following the order T3T > TST > T2T. The device incorporating T2T as the host, doped with (PPy)<sub>2</sub>Ir(acac) and 1,3,5-tris(N-phenylbenzimidazol-2-yl)benzene (TBPI) as the ET layer, achieved a high external quantum efficiency ( $\eta_{ext}$ ) of 17.5% and a power efficiency ( $\eta_p$ ) of 59.0 lm W<sup>-1</sup>. For the same device configuration, the T3T-based device provided values of  $\eta_{ext}$  and  $\eta_p$  of 14.4% and 50.6 lm W<sup>-1</sup>, resp.; the TST-based device provided values of 5.1% and 12.3 lm W<sup>-1</sup>, resp. The superior performance of the T2T-based devices is ascribed to balanced charge recombination; the poor efficiencies of the TST-based devices are ascribed to its relatively low triplet energy (2.54 eV), which did not allow efficient confinement of the triplet excitons on the green phosphorescent emitter (PPy)<sub>2</sub>Ir(acac).

IT 1201800-85-2P, 2,4,6-Tris(9,9'-spirobifluoren-2-yl)-1,3,5-triazine

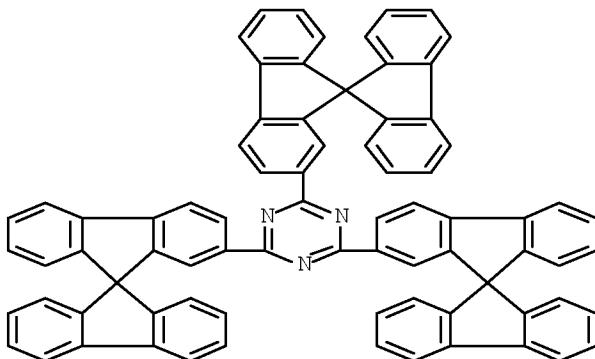
RL: PRP (Properties); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(preparation and use as new electron transport-type host material for highly

efficient green phosphorescent organic LEDs)

RN 1201800-85-2 CAPLUS

CN 1,3,5-Triazine, 2-(9,9'-spirobi[9H-fluoren]-2-yl)-4,6-bis(9,9'-spirobi[9H-fluoren]-3-yl)- (CA INDEX NAME)



OS.CITING REF COUNT: 8 THERE ARE 8 CAPLUS RECORDS THAT CITE THIS RECORD  
(8 CITINGS)  
REFERENCE COUNT: 47 THERE ARE 47 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L9 ANSWER 17 OF 19 CAPLUS COPYRIGHT 2011 ACS on STN  
 ACCESSION NUMBER: 2009:1073520 CAPLUS Full-text  
 DOCUMENT NUMBER: 151:300937  
 TITLE: Novel organic electroluminescent compounds based on anthracene derivatives and organic electroluminescent devices and solar cells using the same  
 INVENTOR(S): Kim, Gi Sik; Cho, Yeong Jun; Kwon, Hyuck Ju; Kim, Bong Ok; Kim, Seong Min; Yoon, Seung Su  
 PATENT ASSIGNEE(S): Gracel Display, Inc., S. Korea  
 SOURCE: Eur. Pat. Appl., 356pp.  
 CODEN: EPXXDW  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

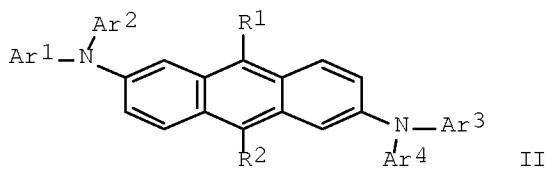
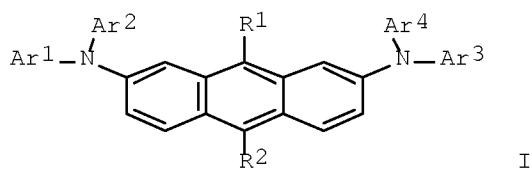
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KR 1001384	B1	20101214		
US 20090256468	A1	20091015	US 2009-380544	20090227
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CN 101613316	A	20091230	CN 2009-10203961	20090302

PRIORITY APPLN. INFO.:

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

OTHER SOURCE(S): MARPAT 151:300937

GI



AB The present invention relates to novel organic electroluminescent compds., and organic electroluminescent devices employing the same in an electroluminescent layer. Organic electroluminescent compds. are described by the general formula I and II (R1 and R2 = independently selected H, D, C1-60 alkyl, C2-60 alkenyl, C2-60 alkynyl, C3-60 cycloalkyl, C4-60 tricycloalkyl, C7-60 bicycloalkyl, C6-60 aryl, C4-60 heteroaryl, 5- or 6-membered heterocycloalkyl containing  $\geq 1$  of N, O and S, spirobifluorenyl, halo, cyano, C1-60 alkoxy, tri(C1-60 alkyl)silyl, di(C1-60 alkyl)(C6-60 aryl)silyl, or tri(C6-60

aryl)silyl, where the alkyl, alkenyl, alkynyl, cycloalkyl, tricycloalkyl, bicycloalkyl, aryl, or heteroaryl groups may be further substituted by  $\geq 1$  of D, C1-60 alkyl, C1-60 alkoxy, halo, tri(C1-60 alkyl)silyl, di(C1-60 alkyl)(C6-60 aryl)silyl, tri(C6-60 aryl)silyl, cyano, C6-60 aryl, (C6-60)ar(C1-60)alkyl, and (C6-60)ar(C1-60)alkoxy; and Ar1-4 = independently selected 5- or 6-membered heteroaryls containing 1-4 heteroatom(s) selected from N, O and S, with the restriction that  $\geq 2$  of Ar1-4 represent pyridyl if a heteroaryl of Ar1-4 represents pyridyl). Organic electroluminescent devices and organic solar cells incorporating the compds. are also described. 3-Aminopyridine.

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L9 ANSWER 18 OF 19 CAPLUS COPYRIGHT 2011 ACS on STN  
 ACCESSION NUMBER: 2009:791541 CAPLUS Full-text  
 DOCUMENT NUMBER: 151:111416  
 TITLE: Novel organic electroluminescent compounds and organic electroluminescent device using the same  
 INVENTOR(S): Eum, Sung Jin; Cho, Young Jun; Kwon, Hyuck Joo; Kim, Bong Ok; Kim, Sung Min; Yoon, Seung Soo  
 PATENT ASSIGNEE(S): Gracel Display Inc., S. Korea  
 SOURCE: Eur. Pat. Appl., 263 pp.  
 CODEN: EPXXDW  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 2075309	A2	20090701	EP 2008-254194	20081231
EP 2075309	A3	20090923		
R: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LI, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR, AL, BA, MK, RS				
KR 2009073925	A	20090703	KR 2007-142000	20071231
KR 974562	B1	20100806		
JP 2009215281	A	20090924	JP 2008-336315	20081226
CN 101508649	A	20090819	CN 2008-10107489	20081231
US 20100019657	A1	20100128	US 2008-319126	20081231
PRIORITY APPLN. INFO.:			KR 2007-142000	A 20071231

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

OTHER SOURCE(S): MARPAT 151:111416

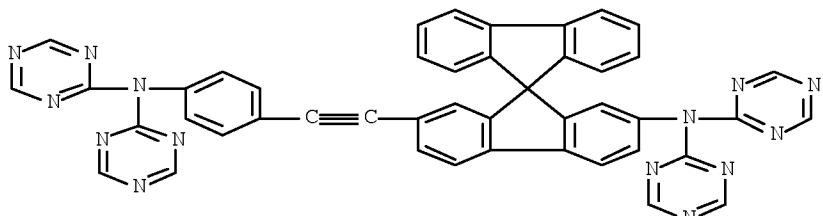
AB Organic electroluminescent compds. are described by the general formula (Ar5)(Ar6)N-Ar1-C.tplbond.C-Ar2-N(Ar3)(Ar4) (Ar1 and Ar2 = independently selected C6-60 arylene or C5-60 heteroarylene which may be further substituted by one or more substituent(s) selected from deuterium, linear or branched C1-60 alkyl and C6-60 aryl; Ar3-6 = independently selected linear or branched C1-60 alkyl, C3-60 cycloalkyl, 5- or 6-membered heterocycloalkyl containing one or more heteroatom(s) selected from N, O, and S, C6-60 aryl or C3-60 heteroaryl; Ar3 and Ar5, or Ar6 and Ar7, may be linked via C3-60 alkylene or C3-60 alkenylene with or without a fused ring to form an alicyclic ring, or a monocyclic or polycyclic aromatic ring; and the aryl or heteroaryl of Ar3-6 may be further substituted by one or more substituent(s) selected from deuterium, C6-60 aryl with or without linear or branched C1-60 alkyl or C6-60 aryl substituents, linear or branched C1-60 alkyl with or without halogen substituent(s), C1-30 alkoxy, C3-60 cycloalkyl, halo, cyano, tri(C1-30)alkylsilyl, di(C1-30)alkyl(C6-30)arylsilyl, and tri(C6-30)arylsilyl). Organic electroluminescent devices, including display devices, and organic solar cells employing the materials are also described.

IT 1167631-63-1

RL: MOA (Modifier or additive use); PRPH (Prophetic); TEM (Technical or engineered material use); USES (Uses)  
(electroluminescent di(triarylamine)ethyne derivs. and organic electroluminescent devices and solar cells using them)

RN 1167631-63-1 CAPLUS

CN INDEX NAME NOT YET ASSIGNED



L9 ANSWER 19 OF 19 CAPLUS COPYRIGHT 2011 ACS on STN

ACCESSION NUMBER: 2005:493816 CAPLUS Full-text

DOCUMENT NUMBER: 143:34908

TITLE: Organic electroluminescent element

hole-blocking layers with six-membered ring unit-containing compounds and spirobifluorene derivatives and electronic devices using them

INVENTOR(S): Vestweber, Horst; Gerhard, Anja; Stoessel, Philipp

PATENT ASSIGNEE(S): Covion Organic Semiconductors G.m.b.H., Germany

SOURCE: PCT Int. Appl., 38 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: German

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2005053055	A1	20050609	WO 2004-EP13314	20041124
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
DE 10356099	A1	20050707	DE 2003-10356099	20031127
EP 1687857	A1	20060809	EP 2004-803245	20041124
EP 1687857	B1	20090909		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, PL, SK, IS				
CN 1954446	A	20070425	CN 2004-80035289	20041124
JP 2007520875	T	20070726	JP 2006-540365	20041124

AT 442675	T 20090915	AT 2004-803245	20041124
US 20070051944	A1 20070308	US 2006-580491	20060523
KR 2006122874	A 20061130	KR 2006-7010343	20060526
PRIORITY APPLN. INFO.:		DE 2003-10356099	A 20031127
		WO 2004-EP13314	W 20041124

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

OTHER SOURCE(S): MARPAT 143:34908

AB Organic electroluminescent devices comprising an anode, a cathode, and  $\geq 1$  emitting layer, which consists of a matrix material which is doped with  $\geq 1$  phosphorescent emitter, are described which employ compds. including units based on six-membered rings formed from C and/or N atoms, especially triazines, pyrimidines, pyridazines, and pyrazines, as materials for a hole-blocking layer between the emitting layer and the cathode. Compds., which may be employed in the devices, are described which comprise spirobifluorene derivs. with  $\geq 1$  triazine unit bonded to them, optionally along with other six-membered ring-containing substituents. The use of the design of the electroluminescent devices in other electronic devices, including organic transistors, organic integrated circuits, organic solar cells, organic laser diodes, or photoreceptors, is also described. Organic transistors, organic integrated circuits, organic solar cells, organic laser diodes, or photoreceptors.

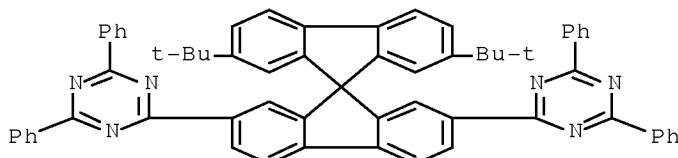
IT 853154-59-3P 853154-60-6P

RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)

(organic electroluminescent element with hole-blocking layers formed from compds. including six-membered rings and spirobifluorene derivs. and electronic devices using them)

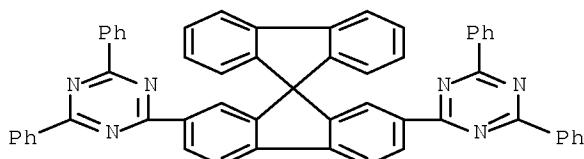
RN 853154-59-3 CAPLUS

CN 1,3,5-Triazine, 2,2'-(2',7'-bis(1,1-dimethylethyl)-9,9'-spirobi[9H-fluorene]-2,7-diyl)bis[4,6-diphenyl- (9CI) (CA INDEX NAME)



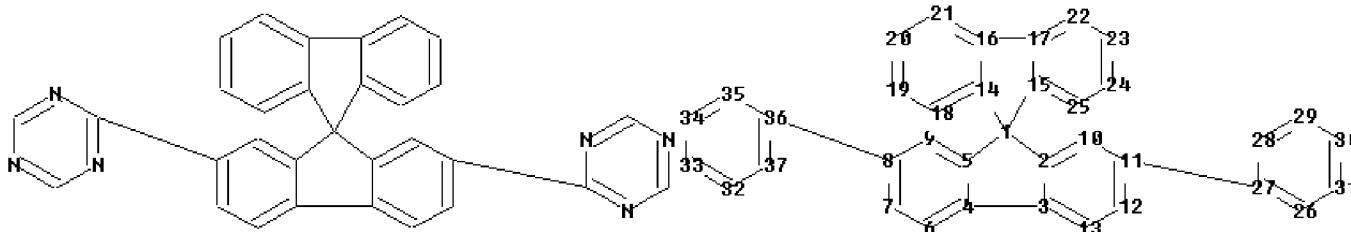
RN 853154-60-6 CAPLUS

CN 1,3,5-Triazine, 2,2'-(9,9'-spirobi[9H-fluorene]-2,7-diyl)bis[4,6-diphenyl- (9CI) (CA INDEX NAME)



=>

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ring nodes :

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23  
 24 25 26 27 28 29 30 31 32 33 34 35 36 37

chain bonds :

8-36 11-27

ring bonds :

1-2 1-5 1-14 1-15 2-3 2-10 3-4 3-13 4-5 4-6 5-9 6-7 7-8 8-9 10-11  
 11-12 12-13 14-16 14-18 15-17 15-25 16-17 16-21 17-22 18-19 19-20 20-21  
 22-23 23-24 24-25  
 26-27 26-31 27-28 28-29 29-30 30-31 32-33 32-37 33-34 34-35 35-36 36-37

exact bonds :

1-2 1-5 1-14 1-15 3-4 8-36 11-27 16-17

normalized bonds :

2-3 2-10 3-13 4-5 4-6 5-9 6-7 7-8 8-9 10-11 11-12 12-13 14-16 14-18  
 15-17 15-25 16-21 17-22 18-19 19-20 20-21 22-23 23-24 24-25 26-27 26-31  
 27-28 28-29  
 29-30 30-31 32-33 32-37 33-34 34-35 35-36 36-37

isolated ring systems :

containing 1 : 26 : 32 :

Match level :

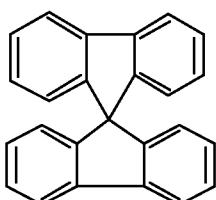
1:Atom 2:Atom 3:Atom 4:Atom 5:Atom 6:Atom 7:Atom 8:Atom 9:Atom 10:Atom  
 11:Atom 12:Atom 13:Atom 14:Atom 15:Atom 16:Atom 17:Atom 18:Atom 19:Atom  
 20:Atom 21:Atom  
 22:Atom 23:Atom 24:Atom 25:Atom 26:Atom 27:Atom 28:Atom 29:Atom 30:Atom  
 31:Atom 32:Atom  
 33:Atom 34:Atom 35:Atom 36:Atom 37:Atom

L10 STRUCTURE UPLOADED

=> d 110

L10 HAS NO ANSWERS

L10 STR



Structure attributes must be viewed using STN Express query preparation.

=> s 110  
SAMPLE SEARCH INITIATED 18:58:12 FILE 'REGISTRY'  
SAMPLE SCREEN SEARCH COMPLETED - 299 TO ITERATE  
  
100.0% PROCESSED 299 ITERATIONS 50 ANSWERS  
INCOMPLETE SEARCH (SYSTEM LIMIT EXCEEDED)  
SEARCH TIME: 00.00.01

FULL FILE PROJECTIONS: ONLINE \*\*COMPLETE\*\*  
BATCH \*\*COMPLETE\*\*  
PROJECTED ITERATIONS: 4943 TO 7017  
PROJECTED ANSWERS: 2441 TO 3957

L11 50 SEA SSS SAM L10

=> s 110 full  
FULL SEARCH INITIATED 18:58:21 FILE 'REGISTRY'  
FULL SCREEN SEARCH COMPLETED - 5998 TO ITERATE

100.0% PROCESSED 5998 ITERATIONS 2973 ANSWERS  
SEARCH TIME: 00.00.01

L12 2973 SEA SSS FUL L10

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> s 112  
L13 1253 L12

=> s 113 and indenofluoren?  
147 INDENOFLUOREN?  
L14 8 L13 AND INDENOFLUOREN?

=> d ibib abs hitstr 8

L14 ANSWER 8 OF 8 CAPLUS COPYRIGHT 2011 ACS on STN  
ACCESSION NUMBER: 2005:239310 CAPLUS Full-text  
DOCUMENT NUMBER: 142:308097  
TITLE: Electronic devices comprising an organic conductor and semiconductor as well as an intermediate buffer layer made of a crosslinked polymer  
INVENTOR(S): Mueller, David Christoph; Reckefuss, Nina; Meerholz, Klaus; Meyer, Frank; Scheurich, Rene; Falcou, Aurelie  
PATENT ASSIGNEE(S): Covion Organic Semiconductors G.m.b.H., Germany  
SOURCE: PCT Int. Appl., 28 pp.  
CODEN: PIXXD2  
DOCUMENT TYPE: Patent  
LANGUAGE: German  
FAMILY ACC. NUM. COUNT: 2  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
WO 2005024971	A1	20050317	WO 2004-EP9903	20040904
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD,				

GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,  
 LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI,  
 NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY,  
 TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW  
 RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM,  
 AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK,  
 EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE,  
 SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE,  
 SN, TD, TG

DE 10340711	A1	20050407	DE 2003-10340711	20030904
EP 1661191	A1	20060531	EP 2004-764854	20040904
EP 1661191	B1	20081217		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, PL, SK				
CN 1849717	A	20061018	CN 2004-80025368	20040904
JP 2007504657	T	20070301	JP 2006-525129	20040904
AT 418161	T	20090115	AT 2004-764854	20040904
US 20060251886	A1	20061109	US 2006-570372	20060321
PRIORITY APPLN. INFO.:				
			DE 2003-10340711	A 20030904
			WO 2004-EP9903	W 20040904

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

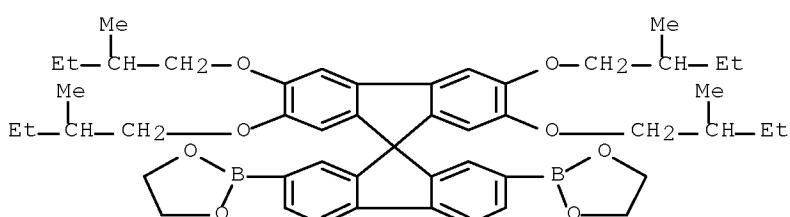
AB The invention relates to electronic devices whose electronic properties can surprisingly be improved to a significant degree by inserting at least one crosslinkable polymeric buffer layer, preferably a cationically crosslinkable polymeric buffer layer, between the conductive doped polymer and the organic semiconductor layer. Particularly good properties are obtained with a buffer layer in which crosslinking is thermally induced, i.e. by raising the temperature to 50-250°. Alternatively, crosslinking can be radiation-induced by adding a photoacid. Also, such a buffer layer can be advantageously applied by means of printing techniques, especially ink-jet printing, as the ideal temperature for the thermal treatment is independent of the glass transition temperature of the material. This avoids having to rely on material that has a low mol. weight, making it possible to apply the layer by means of printing techniques. The next layer (the organic semiconductor layer) can also be applied with the aid of different printing techniques, particularly ink-jet printing, because the buffer layer is rendered insol. by the crosslinking process, thus preventing the buffer layer from solubilizing thereafter.

IT 396123-43-6D, polymers with indenofluorene and phenylamine derivs.

RL: DEV (Device component use); USES (Uses)  
 (electronic devices comprising an organic conductor and semiconductor as well as an intermediate buffer layer made of a crosslinked polymer)

RN 396123-43-6 CAPLUS

CN 1,3,2-Dioxaborolane, 2,2'-[2',3',6',7'-tetrakis(2-methylbutoxy)-9,9'-spirobi[9H-fluorene]-2,7-diyl]bis- (CA INDEX NAME)



OS.CITING REF COUNT: 5 THERE ARE 5 CAPLUS RECORDS THAT CITE THIS RECORD  
(11 CITINGS)  
REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

=> d hist

(FILE 'HOME' ENTERED AT 18:51:58 ON 27 JAN 2011)

FILE 'REGISTRY' ENTERED AT 18:52:31 ON 27 JAN 2011

L1 STRUCTURE uploaded  
L2 1 S L1  
L3 34 S L1 FULL

FILE 'CAPLUS' ENTERED AT 18:53:25 ON 27 JAN 2011

L4 8 S L3

FILE 'STNGUIDE' ENTERED AT 18:54:46 ON 27 JAN 2011

FILE 'REGISTRY' ENTERED AT 18:55:21 ON 27 JAN 2011

L5 STRUCTURE uploaded  
L6 2 S L5  
L7 42 S L5 FULL

FILE 'CAPLUS' ENTERED AT 18:55:57 ON 27 JAN 2011

L8 21 S L7  
L9 19 S L8 AND ELECTROLUMIN?

FILE 'STNGUIDE' ENTERED AT 18:57:09 ON 27 JAN 2011

FILE 'REGISTRY' ENTERED AT 18:57:47 ON 27 JAN 2011

L10 STRUCTURE uploaded  
L11 50 S L10  
L12 2973 S L10 FULL

FILE 'CAPLUS' ENTERED AT 18:58:26 ON 27 JAN 2011

L13 1253 S L12  
L14 8 S L13 AND INDENOFLUOREN?

=> s 13 and tetraarylmethane  
1045677 13  
45 TETRAARYLMETHANE  
22 TETRAARYLMETHANES  
61 TETRAARYLMETHANE  
(TETRAARYLMETHANE OR TETRAARYLMETHANES)  
L15 5 13 AND TETRAARYLMETHANE

=> d ibib abs hitstr 5

L15 ANSWER 5 OF 5 CAPLUS COPYRIGHT 2011 ACS on STN  
ACCESSION NUMBER: 1951:6136 CAPLUS Full-text  
DOCUMENT NUMBER: 45:6136  
ORIGINAL REFERENCE NO.: 45:1079g-i,1080a  
TITLE: Hindered tetraarylmethanes  
AUTHOR(S): Adams, Roger; Campbell, John B.  
CORPORATE SOURCE: Univ. of Illinois, Urbana  
SOURCE: Journal of the American Chemical Society (1950), 72,  
153-5  
CODEN: JACSAT; ISSN: 0002-7863

DOCUMENT TYPE: Journal

LANGUAGE: Unavailable

AB 9-Fluorenone (210 g.) in 600 cc. C6H6 was added to the Grignard reagent from 42 g. Mg and 300 g. o-BrC6H4Me, the mixture refluxed 9 h., decomposed with 500 cc. 20% HCl, the organic layer separated, the solvents removed, and the residue steam-distilled, yielding 249 g. 9-hydroxy-9-o-tolylfluorene (I), m. 120.5-2° (m.ps. corrected) (from 90-110° petr. ether). I (1 g.), 1.0 g. PhOH, and 1.75 g. concentrated H2SO4 in 12 cc. AcOH allowed to stand 24 h. at room temperature yielded 1.05 g. p-(biphenylene-o-tolylmethyl)phenol, m. 139-41°. I (0.70 g.), 1 g. PhNH2, and 1 g. concentrated HCl in 4 cc. AcOH refluxed 3 h. yielded 0.67 g. p-(biphenylene-o-tolylmethyl)aniline, m. 152.0-3.5° (from petr. ether). Condensation of I with o-toluidine yielded 70% (4-biphenylene-o-tolylmethyl)-2-methylaniline (II), m. 172-4°. II (11.0 g.) and 3.05 succinic anhydride in 90 cc. dry C6H6 refluxed 20 min. yielded 13.0 g. of the N-succinyl derivative, m. 169-70° (decomposition). II (2.50 g.) in 75 cc. EtOAc and 1.561 g. d-camphorsulfonic acid in 75 cc. hot EtOAc yielded 3.87 g. salt which softened at 195° and decomposed 215-27°; when the salt was hydrolyzed with 5% EtOH-NaOH (1:1), inactive II, m. 172-4°, was recovered. Condensation of I with p-xylidine yielded 66% 4-(biphenylene-o-tolylmethyl)-2,5-dimethylaniline (III), m. 188-9°. III (2.34 g.) and 0.92 g. o-C6H4(CO)2O in 150 cc. dry C6H6 refluxed 30 min. yielded 2.59 g. the N-phthaloyl derivative (IV), m.p. indefinite. Equal amts. of III and o-C6H4(CO)2O heated at 180° for 30 min. yielded 90%

N-[4-(biphenylene-o-tolylmethyl)-2,5-dimethylphenyl]phthalimide, m. 232-4° (from absolute EtOH-C6H6 3:1). Quinine salt of IV, decompose 150-60° (evolution of water),  $[\alpha]_{25D}$  -67°; it did not effect a resolution of IV. III (3.00 g.) and 1.45 g. d-camphoric anhydride melted and kept 15 min. at 150° yielded 2.75 g. N-camphoryl derivative, decompose 155-85° (foaming),  $[\alpha]_{25D}$  16°. OS.CITING REF COUNT:

1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD

(1 CITINGS)

=> s 113 and electrolumin?

3 ELCTROLUMIN?

L16 0 L13 AND ELCTROLUMIN?

=> s 113 and electrolumin?

113772 ELECTROLUMIN?

L17 739 L13 AND ELECTROLUMIN?

=> s 117 and triptycene

822 TRIPTYCENE

211 TRIPTYCENES

867 TRIPTYCENE

(TRIPTYCENE OR TRIPTYCENES)

L18 2 L17 AND TRIPTYCENE

=> d ibib abs hitstr 2

L18 ANSWER 2 OF 2 CAPLUS COPYRIGHT 2011 ACS on STN

ACCESSION NUMBER: 1999:237505 CAPLUS Full-text

DOCUMENT NUMBER: 130:344493

TITLE: Novel amorphous molecular materials for organic light-emitting devices

AUTHOR(S): Weinfurtner, Karl-Heinz; Weissortel, Frank; Harmgarth, Gabriele; Salbeck, Josef

CORPORATE SOURCE: Max-Planck-Institut fur Polymerforschung, Mainz, D-55128, Germany

SOURCE: Proceedings of SPIE-The International Society for Optical Engineering (1998), 3476(Organic Light-Emitting Materials and Devices II), 40-48  
CODEN: PSISDG; ISSN: 0277-786X  
PUBLISHER: SPIE-The International Society for Optical Engineering  
DOCUMENT TYPE: Journal  
LANGUAGE: English

AB New structures for blue light emitting amorphous materials, based on an extended spiro-structural concept are reported. The chromophores are essentially based on p-oligophenyl chromophores, with further improved optical and morphol. properties. The photoluminescence quantum efficiency of the blue emitter in amorphous solid state reach .apprx.70%. New oxadiazole based electron transport materials are presented, where triptycenes were used as new structural motif to increase the morphol. stability and preserve the electronic properties of the parent compound Both, the emitting material and the electron transport materials can be processed into thin amorphous films with high morphol. stability by vapor deposition as well as by spin-coating from solns. in organic solvents.

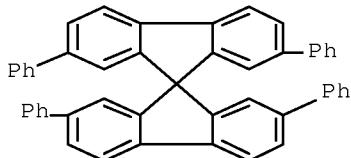
IT 171408-92-7 224456-30-8

RL: PRP (Properties)

(novel amorphous mol. materials for organic light-emitting devices with luminescence, visible spectra and structure)

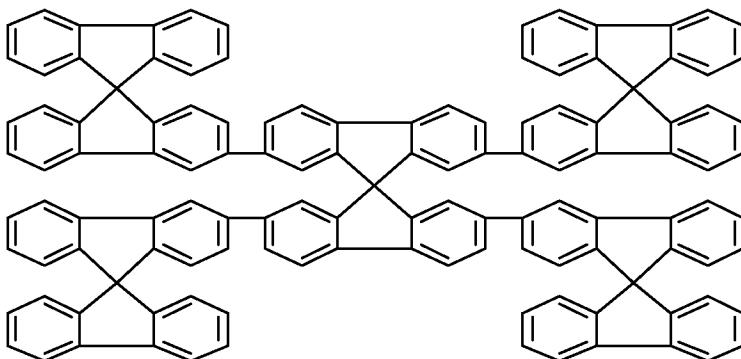
RN 171408-92-7 CAPLUS

CN 9,9'-Spirobi[9H-fluorene], 2,2',7,7'-tetraphenyl- (CA INDEX NAME)



RN 224456-30-8 CAPLUS

CN 3,2'':2''',3''''-Ter-9,9'-spirobi[9H-fluorene], 7'',7''''-bis(9,9'-spirobi[9H-fluorene]-3-yl)- (9CI) (CA INDEX NAME)



OS.CITING REF COUNT:

27

THERE ARE 27 CAPLUS RECORDS THAT CITE THIS RECORD (27 CITINGS)

REFERENCE COUNT:

40

THERE ARE 40 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

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L18 ANSWER 1 OF 2 CAPLUS COPYRIGHT 2011 ACS on STN  
ACCESSION NUMBER: 2004:331637 CAPLUS Full-text  
DOCUMENT NUMBER: 140:365374  
TITLE: Organic light-emitting diode devices with improved operational stability  
INVENTOR(S): Jarikov, Viktor V.  
PATENT ASSIGNEE(S): Eastman Kodak Company, USA  
SOURCE: U.S. Pat. Appl. Publ., 108 pp., Cont.-in-part of U.S. Ser. No. 131,801, abandoned.  
CODEN: USXXCO  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 2  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20040076853	A1	20040422	US 2003-634324	20030805
US 7183010	B2	20070227		
TW 314947	B	20090921	TW 2003-105220	20030311
JP 2003347058	A	20031205	JP 2003-118497	20030423
CN 1453886	A	20031105	CN 2003-124026	20030424
CN 100452475	C	20090114		

PRIORITY APPLN. INFO.: US 2002-131801 B2 20020424

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

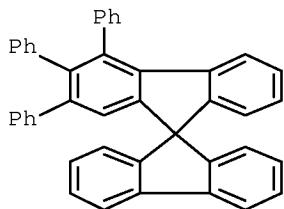
OTHER SOURCE(S): MARPAT 140:365374

AB Organic light-emitting devices which comprise a substrate; an anode and a cathode disposed over the substrate; a luminescent layer disposed between the anode and the cathode are described in which the luminescent layer includes a host and  $\geq 1$  dopant; the host including a solid organic material comprising a mixture of  $\geq 2$  components including a first component that is an organic compound capable of transporting either electrons and/or holes and of forming both monomer state and an aggregate state and a second component of that is an organic compound that upon mixing with the first host component is capable of forming a continuous and substantially pin-hole-free layer, while the dopant of is selected to produce light from the light-emitting device. The first component is capable of forming an aggregate state either in the ground electronic state or in an excited electronic state that results in a different absorption or emission spectrum or both relative to the absorption or emission spectrum or both of the monomer state, resp., or of forming an aggregate state whose presence results in a quantum yield of luminescence of the monomer state being different relative to the quantum yield of luminescence of the monomer state in the absence of the aggregate state. The aggregate state may be crystalline

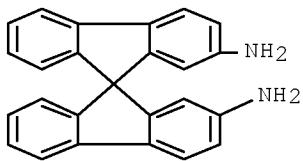
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67665-45-6, 9,9'-Spirobi(9H-fluorene)-2,2'-diamine  
67665-48-9, 9,9'-Spirobi(9H-fluorene)-2,2'-dicarbonitrile  
171408-92-7 462104-51-4 473906-55-7  
497157-27-4 503307-40-2 503307-41-3  
RL: DEV (Device component use); USES (Uses)  
(organic light-emitting diode devices using luminescent mixts.)

RN 22815-17-4 CAPLUS

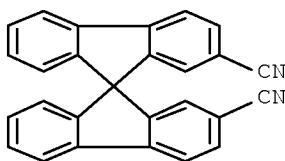
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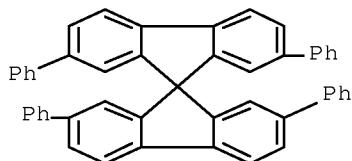
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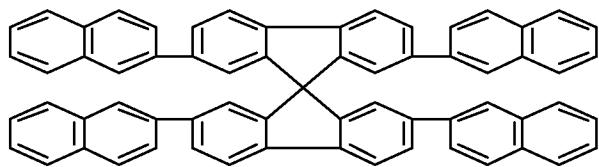
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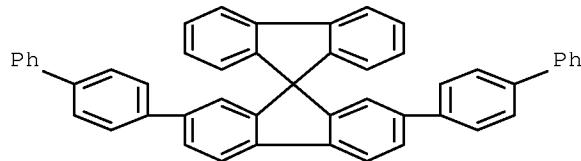
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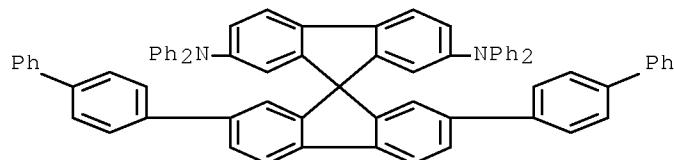
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CN 9,9'-Spirobi[9H-fluorene]-2,2',7,7'-tetra-2-naphthalenyl (CA INDEX NAME)



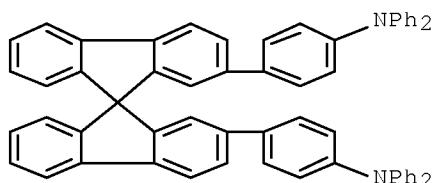
RN 473906-55-7 CAPLUS  
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RN 497157-27-4 CAPLUS  
 CN 9,9'-Spirobi[9H-fluorene]-2,7-diamine,  
 2',7'-bis([1,1'-biphenyl]-4-yl)-N2,N2,N7,N7-tetraphenyl- (CA INDEX NAME)

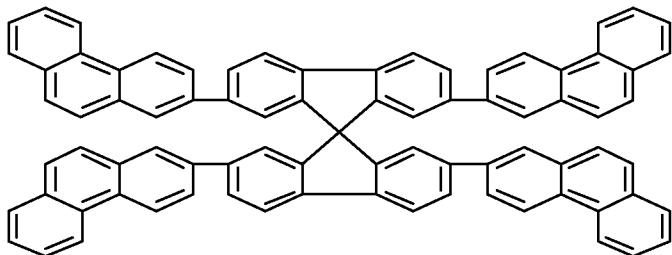


RN 503307-40-2 CAPLUS  
 CN Benzenamine, 4,4'-(9,9'-spirobi[9H-fluorene]-2,2'-diyl)bis[N,N-diphenyl-]  
 (CA INDEX NAME)



RN 503307-41-3 CAPLUS  
 CN 9,9'-Spirobi[9H-fluorene], 2,2',7,7'-tetra-2-phenanthrenyl- (CA INDEX

NAME)



OS.CITING REF COUNT: 17 THERE ARE 17 CAPLUS RECORDS THAT CITE THIS RECORD (17 CITINGS)  
REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

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FILE 'REGISTRY' ENTERED AT 18:52:31 ON 27 JAN 2011

L1 STRUCTURE uploaded  
L2 1 S L1  
L3 34 S L1 FULL

FILE 'CPLUS' ENTERED AT 18:53:25 ON 27 JAN 2011

L4 8 S L3

FILE 'STNGUIDE' ENTERED AT 18:54:46 ON 27 JAN 2011

FILE 'REGISTRY' ENTERED AT 18:55:21 ON 27 JAN 2011  
L5 STRUCTURE uploaded  
L6 2 S L5  
L7 42 S L5 FULL

FILE 'CPLUS' ENTERED AT 18:55:57 ON 27 JAN 2011

L8 21 S L7  
L9 19 S L8 AND ELECTROLUMIN?

FILE 'STNGUIDE' ENTERED AT 18:57:09 ON 27 JAN 2011

FILE 'REGISTRY' ENTERED AT 18:57:47 ON 27 JAN 2011  
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L11 50 S L10  
L12 2973 S L10 FULL

FILE 'CPLUS' ENTERED AT 18:58:26 ON 27 JAN 2011

L13 1253 S L12  
L14 8 S L13 AND INDENOFLUOREN?  
L15 5 S L13 AND TETRAARYLMETHANE  
L16 0 S L13 AND ELECTROLUMIN?  
L17 739 S L13 AND ELECTROLUMIN?  
L18 2 S L17 AND TRIPYCENE

This file contains CAS Registry Numbers for easy and accurate substance identification.

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10950 PYRIDAZINE?  
L19 4 L17 AND PYRIDAZINE?

=> d ibib abs hitstr 4

L19 ANSWER 4 OF 4 CAPLUS COPYRIGHT 2011 ACS on STN  
ACCESSION NUMBER: 2004:331637 CAPLUS Full-text  
DOCUMENT NUMBER: 140:365374  
TITLE: Organic light-emitting diode devices with improved operational stability  
INVENTOR(S): Jarikov, Viktor V.  
PATENT ASSIGNEE(S): Eastman Kodak Company, USA  
SOURCE: U.S. Pat. Appl. Publ., 108 pp., Cont.-in-part of U.S. Ser. No. 131,801, abandoned.  
CODEN: USXXCO  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 2  
PATENT INFORMATION:

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US 7183010	B2	20070227		
TW 314947	B	20090921	TW 2003-105220	20030311
JP 2003347058	A	20031205	JP 2003-118497	20030423
CN 1453886	A	20031105	CN 2003-124026	20030424
CN 100452475	C	20090114		

PRIORITY APPLN. INFO.: US 2002-131801 B2 20020424

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

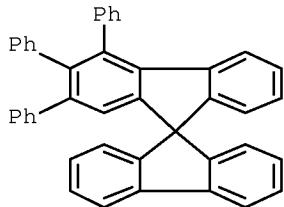
OTHER SOURCE(S): MARPAT 140:365374

AB Organic light-emitting devices which comprise a substrate; an anode and a cathode disposed over the substrate; a luminescent layer disposed between the anode and the cathode are described in which the luminescent layer includes a host and  $\geq 1$  dopant; the host including a solid organic material comprising a mixture of  $\geq 2$  components including a first component that is an organic compound capable of transporting either electrons and/or holes and of forming both monomer state and an aggregate state and a second component of that is an organic compound that upon mixing with the first host component is capable of forming a continuous and substantially pin-hole-free layer, while the dopant of is selected to produce light from the light-emitting device. The first component is capable of forming an aggregate state either in the ground electronic state or in an excited electronic state that results in a different absorption or emission spectrum or both relative to the absorption or emission spectrum or both of the monomer state, resp., or of forming an aggregate state whose presence results in a quantum yield of luminescence of the monomer state being different relative to the quantum yield of luminescence of the monomer state in the absence of the aggregate state. The aggregate state may be crystalline

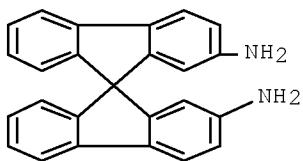
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67665-45-6, 9,9'-Spirobi(9H-fluorene)-2,2'-diamine  
67665-48-9, 9,9'-Spirobi(9H-fluorene)-2,2'-dicarbonitrile  
171408-92-7 462104-51-4 473906-55-7  
497157-27-4 503307-40-2 503307-41-3

RL: DEV (Device component use); USES (Uses)  
(organic light-emitting diode devices using luminescent mixts.)

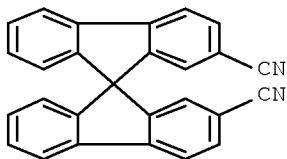
RN 22815-17-4 CAPLUS  
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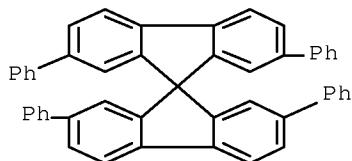
RN 67665-45-6 CAPLUS  
CN 9,9'-Spirobi[9H-fluorene]-2,2'-diamine (CA INDEX NAME)



RN 67665-48-9 CAPLUS  
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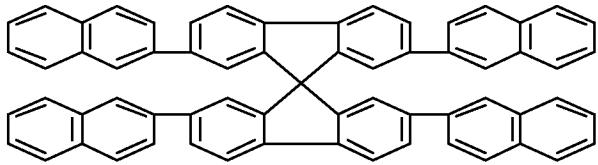


RN 171408-92-7 CAPLUS  
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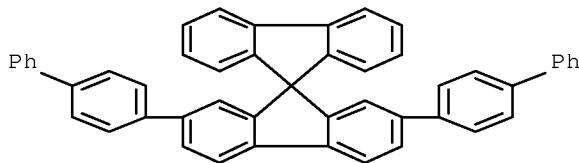


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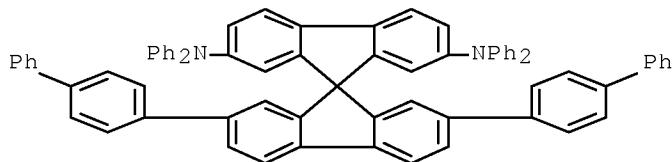
CN 9,9'-Spirobi[9H-fluorene], 2,2',7,7'-tetra-2-naphthalenyl- (CA INDEX  
NAME)



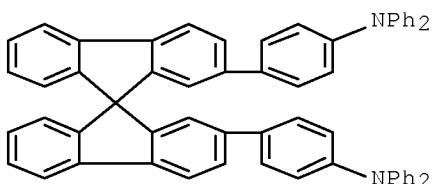
RN 473906-55-7 CAPLUS  
CN 9,9'-Spirobi[9H-fluorene], 2',7'-bis([1,1'-biphenyl]-4-yl)- (CA INDEX  
NAME)



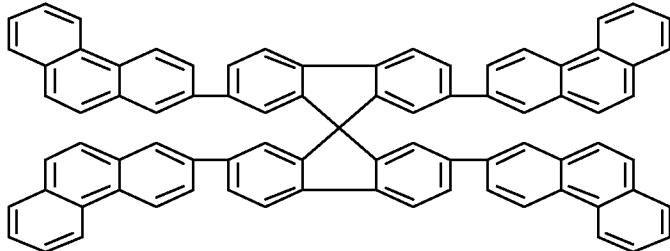
RN 497157-27-4 CAPLUS  
CN 9,9'-Spirobi[9H-fluorene]-2,7-diamine,  
2',7'-bis([1,1'-biphenyl]-4-yl)-N2,N2,N7,N7-tetraphenyl- (CA INDEX NAME)



RN 503307-40-2 CAPLUS  
CN Benzenamine, 4,4'-(9,9'-spirobi[9H-fluorene]-2,2'-diyl)bis[N,N-diphenyl-  
(CA INDEX NAME)]



RN 503307-41-3 CAPLUS  
CN 9,9'-Spirobi[9H-fluorene], 2,2',7,7'-tetra-2-phenanthrenyl- (CA INDEX  
NAME)



OS.CITING REF COUNT: 17 THERE ARE 17 CAPLUS RECORDS THAT CITE THIS  
RECORD (17 CITINGS)  
REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

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L19 ANSWER 3 OF 4 CAPLUS COPYRIGHT 2011 ACS on STN  
ACCESSION NUMBER: 2005:493816 CAPLUS Full-text  
DOCUMENT NUMBER: 143:34908  
TITLE: Organic electroluminescent element  
hole-blocking layers with six-membered ring  
unit-containing compounds and spirobifluorene  
derivatives and electronic devices using them  
INVENTOR(S): Vestweber, Horst; Gerhard, Anja; Stoessel, Philipp  
PATENT ASSIGNEE(S): Covion Organic Semiconductors G.m.b.H., Germany  
SOURCE: PCT Int. Appl., 38 pp.  
CODEN: PIXXD2  
DOCUMENT TYPE: Patent  
LANGUAGE: German  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2005053055	A1	20050609	WO 2004-EP13314	20041124
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DE 10356099	A1	20050707	DE 2003-10356099	20031127
EP 1687857	A1	20060809	EP 2004-803245	20041124

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R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, PL, SK, IS				
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JP 2007520875	T	20070726	JP 2006-540365	20041124
AT 442675	T	20090915	AT 2004-803245	20041124
US 20070051944	A1	20070308	US 2006-580491	20060523
KR 2006122874	A	20061130	KR 2006-7010343	20060526
PRIORITY APPLN. INFO.:			DE 2003-10356099	A 20031127
			WO 2004-EP13314	W 20041124

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

OTHER SOURCE(S): MARPAT 143:34908

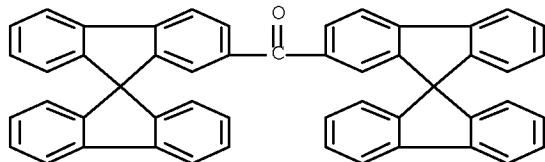
AB Organic electroluminescent devices comprising an anode, a cathode, and  $\geq 1$  emitting layer, which consists of a matrix material which is doped with  $\geq 1$  phosphorescent emitter, are described which employ compds. including units based on six-membered rings formed from C and/or N atoms, especially triazines, pyrimidines, pyridazines, and pyrazines, as materials for a hole-blocking layer between the emitting layer and the cathode. Compds., which may be employed in the devices, are described which comprise spirobifluorene derivs. with  $\geq 1$  triazine unit bonded to them, optionally along with other six-membered ring-containing substituents. The use of the design of the electroluminescent devices in other electronic devices, including organic transistors, organic integrated circuits, organic solar cells, organic laser diodes, or photoreceptors, is also described. Organic transistors, organic integrated circuits, organic solar cells, organic laser diodes, or photoreceptors.

IT 782504-07-8

RL: DEV (Device component use); USES (Uses)  
(organic electroluminescent element with hole-blocking layers formed from compds. including six-membered rings and spirobifluorene derivs. and electronic devices using them)

RN 782504-07-8 CAPLUS

CN Methanone, bis(9,9'-spirobi[9H-fluoren]-2-yl)- (CA INDEX NAME)

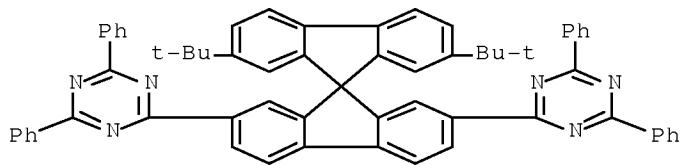


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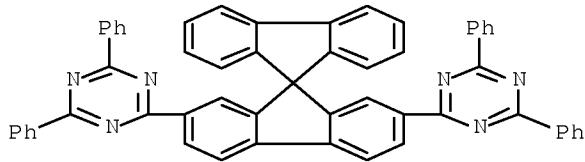
RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
(organic electroluminescent element with hole-blocking layers formed from compds. including six-membered rings and spirobifluorene derivs. and electronic devices using them)

RN 853154-59-3 CAPLUS

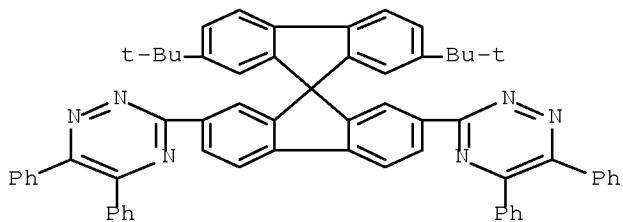
CN 1,3,5-Triazine, 2,2'-(2',7'-bis(1,1-dimethylethyl)-9,9'-spirobi[9H-fluorene]-2,7-diyl)bis[4,6-diphenyl- (9CI) (CA INDEX NAME)



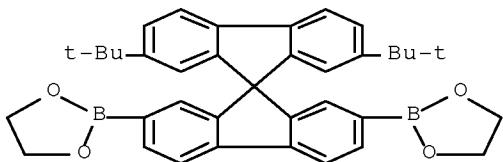
RN 853154-60-6 CAPLUS  
 CN 1,3,5-Triazine, 2,2'-(9,9'-spirobi[9H-fluorene]-2,7-diyl)bis[4,6-diphenyl- (9CI) (CA INDEX NAME)]



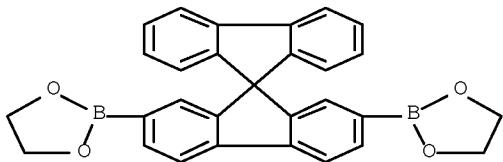
RN 853154-61-7 CAPLUS  
 CN 1,2,4-Triazine, 3,3'-(2',7'-bis(1,1-dimethylethyl)-9,9'-spirobi[9H-fluorene]-2,7-diyl)bis[5,6-diphenyl- (CA INDEX NAME)]



IT 463944-32-3 853154-62-8  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (organic electroluminescent element with hole-blocking layers  
 formed from compds. including six-membered rings and spirobifluorene  
 derivs. and electronic devices using them)  
 RN 463944-32-3 CAPLUS  
 CN 1,3,2-Dioxaborolane, 2,2'-(2',7'-bis(1,1-dimethylethyl)-9,9'-spirobi[9H-  
 fluorene]-2,7-diyl)bis- (CA INDEX NAME)



RN 853154-62-8 CAPLUS  
 CN 1,3,2-Dioxaborolane, 2,2'-(9,9'-spirobi[9H-fluorene]-2,7-diyl)bis- (9CI)  
 (CA INDEX NAME)



OS.CITING REF COUNT: 4 THERE ARE 4 CAPLUS RECORDS THAT CITE THIS RECORD  
 (9 CITINGS)  
 REFERENCE COUNT: 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

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 78707 PYRIMIDINE?  
 L20 11 L17 AND PYRIMIDINE?

=> d ibib abs hitstr 10-11

L20 ANSWER 10 OF 11 CAPLUS COPYRIGHT 2011 ACS on STN  
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 DOCUMENT NUMBER: 140:365374  
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 INVENTOR(S): Jarikov, Viktor V.  
 PATENT ASSIGNEE(S): Eastman Kodak Company, USA  
 SOURCE: U.S. Pat. Appl. Publ., 108 pp., Cont.-in-part of U.S.  
 Ser. No. 131,801, abandoned.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 2  
 PATENT INFORMATION:

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CN 1453886	A	20031105	CN 2003-124026	20030424

CN 100452475

C 20090114

US 2002-131801

B2 20020424

PRIORITY APPLN. INFO.:

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

OTHER SOURCE(S): MARPAT 140:365374

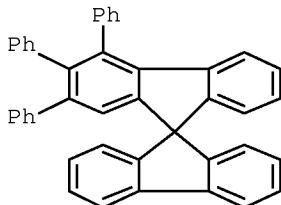
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67665-48-9, 9,9'-Spirobi(9H-fluorene)-2,2'-dicarbonitrile  
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497157-27-4 503307-40-2 503307-41-3

RL: DEV (Device component use); USES (Uses)  
(organic light-emitting diode devices using luminescent mixts.)

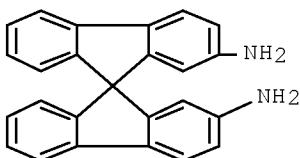
RN 22815-17-4 CAPLUS

CN 9,9'-Spirobi[9H-fluorene], 2',3',4'-triphenyl- (CA INDEX NAME)



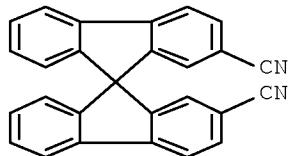
RN 67665-45-6 CAPLUS

CN 9,9'-Spirobi[9H-fluorene]-2,2'-diamine (CA INDEX NAME)



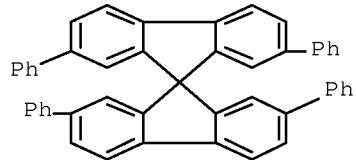
RN 67665-48-9 CAPLUS

CN 9,9'-Spirobi[9H-fluorene]-2,2'-dicarbonitrile (CA INDEX NAME)



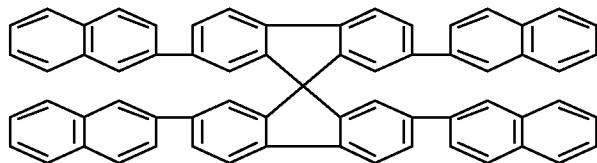
RN 171408-92-7 CAPLUS

CN 9,9'-Spirobi[9H-fluorene], 2,2',7,7'-tetraphenyl- (CA INDEX NAME)



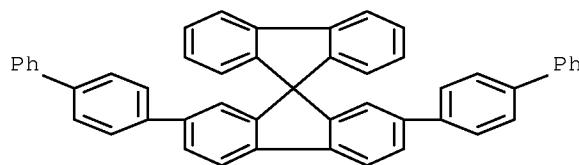
RN 462104-51-4 CAPLUS

CN 9,9'-Spirobi[9H-fluorene], 2,2',7,7'-tetra-2-naphthalenyl- (CA INDEX NAME)



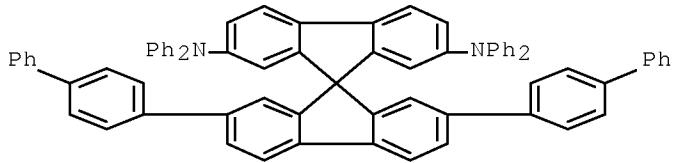
RN 473906-55-7 CAPLUS

CN 9,9'-Spirobi[9H-fluorene], 2',7'-bis([1,1'-biphenyl]-4-yl)- (CA INDEX NAME)

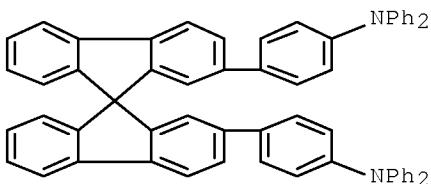


RN 497157-27-4 CAPLUS

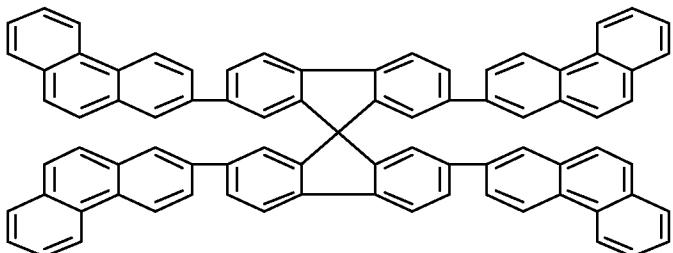
CN 9,9'-Spirobi[9H-fluorene]-2,7-diamine,  
2',7'-bis([1,1'-biphenyl]-4-yl)-N2,N2,N7,N7-tetraphenyl- (CA INDEX NAME)



RN 503307-40-2 CAPLUS  
CN Benzenamine, 4,4'-(9,9'-spirobi[9H-fluorene]-2,2'-diyl)bis[N,N-diphenyl- (CA INDEX NAME)



RN 503307-41-3 CAPLUS  
CN 9,9'-Spirobi[9H-fluorene], 2,2',7,7'-tetra-2-phenanthrenyl- (CA INDEX NAME)



OS.CITING REF COUNT: 17 THERE ARE 17 CAPLUS RECORDS THAT CITE THIS RECORD (17 CITINGS)  
REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L20 ANSWER 11 OF 11 CAPLUS COPYRIGHT 2011 ACS on STN  
ACCESSION NUMBER: 2002:542530 CAPLUS [Full-text](#)  
DOCUMENT NUMBER: 137:239381  
TITLE: Highly bright blue organic light-emitting devices using spirobifluorene-cored conjugated compounds  
AUTHOR(S): Wu, C. C.; Lin, Y. T.; Chiang, H. H.; Cho, T. Y.;

CORPORATE SOURCE: Chen, C. W.; Wong, K. T.; Liao, Y. L.; Lee, G. H.;  
 Peng, S. M.  
 Graduate Institute of Electronics Engineering,  
 Graduate Institute of Electro-Optical Engineering,  
 Department of Electrical Engineering, National Taiwan  
 University, Taipei, 10617, Taiwan

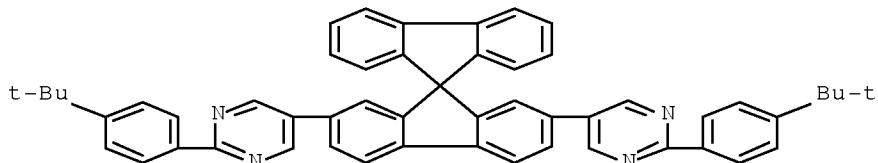
SOURCE: Applied Physics Letters (2002), 81(4), 577-579  
 CODEN: APPLAB; ISSN: 0003-6951

PUBLISHER: American Institute of Physics  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

AB An efficient and morphol. stable pyrimidine-containing spirobifluorene-cored oligoaryl, 2,7-bis[2-(4-tert-butylphenyl) pyrimidine-5-yl]-9,9'-spirobifluorene (TBPSF), as an emitter or a host for blue organic light-emitting devices (OLEDs), is reported. The steric hindrance inherent with the mol. structure renders the material a record-high neat-film photoluminescence (PL) quantum yield of 80% as a pure blue emitter (PL peak at 430 nm) of low mol. weight, and a very high glass-transition temperature (Tg) of 195°. Blue OLEDs employing this compound as the emitter or the emitting host exhibit unusual endurance for high currents over 5000 mA/cm<sup>2</sup>. When TBPSF was used as a host for perylene in a blue OLED, maximal brightness of .apprx.80000 cd/m<sup>2</sup> had been achieved, representing the highest values reported for blue OLEDs under d.c. driving.

IT 459216-40-1  
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)  
 (highly bright blue organic light-emitting devices using spirobifluorene-cored conjugated compds.)

RN 459216-40-1 CAPLUS  
 CN Pyrimidine, 5,5'-(9,9'-spirobi[9H-fluorene]-2,7-diyl)bis[2-[4-(1,1-dimethylethyl)phenyl]- (CA INDEX NAME)



OS.CITING REF COUNT: 76 THERE ARE 76 CAPLUS RECORDS THAT CITE THIS RECORD (76 CITINGS)  
 REFERENCE COUNT: 24 THERE ARE 24 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

=> d ibib abs hitstr 8-9

L20 ANSWER 8 OF 11 CAPLUS COPYRIGHT 2011 ACS on STN  
 ACCESSION NUMBER: 2005:493816 CAPLUS Full-text  
 DOCUMENT NUMBER: 143:34908  
 TITLE: Organic electroluminescent element  
 hole-blocking layers with six-membered ring  
 unit-containing compounds and spirobifluorene  
 derivatives and electronic devices using them

INVENTOR(S): Vestweber, Horst; Gerhard, Anja; Stoessel, Philipp  
 PATENT ASSIGNEE(S): Covion Organic Semiconductors G.m.b.H., Germany  
 SOURCE: PCT Int. Appl., 38 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: German  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2005053055	A1	20050609	WO 2004-EP13314	20041124
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
DE 10356099	A1	20050707	DE 2003-10356099	20031127
EP 1687857	A1	20060809	EP 2004-803245	20041124
EP 1687857	B1	20090909		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, PL, SK, IS				
CN 1954446	A	20070425	CN 2004-80035289	20041124
JP 2007520875	T	20070726	JP 2006-540365	20041124
AT 442675	T	20090915	AT 2004-803245	20041124
US 20070051944	A1	20070308	US 2006-580491	20060523
KR 2006122874	A	20061130	KR 2006-7010343	20060526
PRIORITY APPLN. INFO.:			DE 2003-10356099	A 20031127
			WO 2004-EP13314	W 20041124

#### ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

OTHER SOURCE(S): MARPAT 143:34908

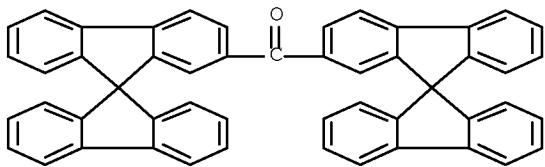
AB Organic **electroluminescent** devices comprising an anode, a cathode, and  $\geq 1$  emitting layer, which consists of a matrix material which is doped with  $\geq 1$  phosphorescent emitter, are described which employ compds. including units based on six-membered rings formed from C and/or N atoms, especially triazines, **pyrimidines**, pyridazines, and pyrazines, as materials for a hole-blocking layer between the emitting layer and the cathode. Compds., which may be employed in the devices, are described which comprise spirobifluorene derivs. with  $\geq 1$  triazine unit bonded to them, optionally along with other six-membered ring-containing substituents. The use of the design of the **electroluminescent** devices in other electronic devices, including organic transistors, organic integrated circuits, organic solar cells, organic laser diodes, or photoreceptors, is also described. Organic transistors, organic integrated circuits, organic solar cells, organic laser diodes, or photoreceptors.

IT 782504-07-8

RL: DEV (Device component use); USES (Uses)  
 (organic **electroluminescent** element with hole-blocking layers formed from compds. including six-membered rings and spirobifluorene derivs. and electronic devices using them)

RN 782504-07-8 CAPLUS

CN Methanone, bis(9,9'-spirobi[9H-fluoren]-2-yl)- (CA INDEX NAME)



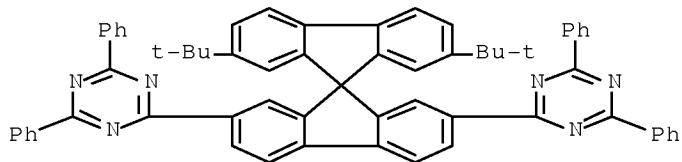
IT 853154-59-3P 853154-60-6P 853154-61-7P

RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)

(organic electroluminescent element with hole-blocking layers formed from compds. including six-membered rings and spirobifluorene derivs. and electronic devices using them)

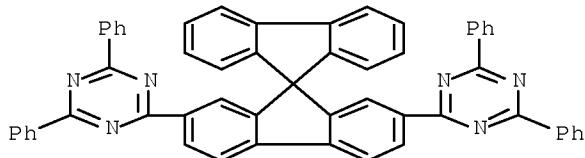
RN 853154-59-3 CAPLUS

CN 1,3,5-Triazine, 2,2'-(2',7'-bis(1,1-dimethylethyl)-9,9'-spirobi[9H-fluorene]-2,7-diyl)bis[4,6-diphenyl- (9CI) (CA INDEX NAME)



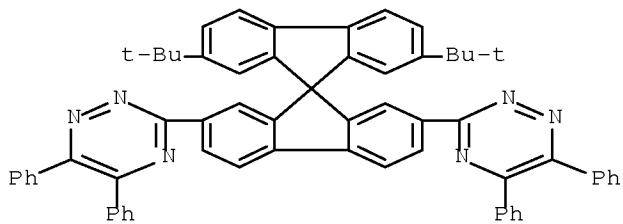
RN 853154-60-6 CAPLUS

CN 1,3,5-Triazine, 2,2'-(9,9'-spirobi[9H-fluorene]-2,7-diyl)bis[4,6-diphenyl- (9CI) (CA INDEX NAME)



RN 853154-61-7 CAPLUS

CN 1,2,4-Triazine, 3,3'-(2',7'-bis(1,1-dimethylethyl)-9,9'-spirobi[9H-fluorene]-2,7-diyl)bis[5,6-diphenyl- (CA INDEX NAME)

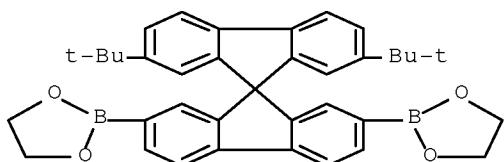


IT 463944-32-3 853154-62-8

RL: RCT (Reactant); RACT (Reactant or reagent)  
 (organic electroluminescent element with hole-blocking layers  
 formed from compds. including six-membered rings and spirobifluorene  
 derivs. and electronic devices using them)

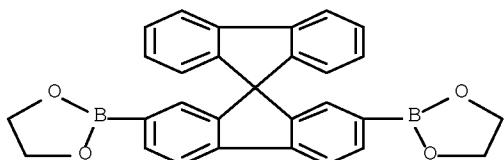
RN 463944-32-3 CAPLUS

CN 1,3,2-Dioxaborolane, 2,2'-(2',7'-bis(1,1-dimethylethyl)-9,9'-spirobi[9H-fluorene]-2,7-diyl)bis- (CA INDEX NAME)



RN 853154-62-8 CAPLUS

CN 1,3,2-Dioxaborolane, 2,2'-(9,9'-spirobi[9H-fluorene]-2,7-diyl)bis- (9CI)  
 (CA INDEX NAME)



OS.CITING REF COUNT: 4 THERE ARE 4 CAPLUS RECORDS THAT CITE THIS RECORD  
 (9 CITINGS)

REFERENCE COUNT: 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L20 ANSWER 9 OF 11 CAPLUS COPYRIGHT 2011 ACS on STN

ACCESSION NUMBER: 2004:609961 CAPLUS Full-text

DOCUMENT NUMBER: 141:164549

TITLE: Pyrimidine spirobifluorene oligomer for  
 organic light-emitting device

INVENTOR(S): Wong, Ken Tsung; Liao, Yuan Li; Wu, Chung Chih; Lin,  
 Yu Ting; Chiang, Huo Hsien

PATENT ASSIGNEE(S): Echem Hightech Co., Ltd., Taiwan  
 SOURCE: U.S. Pat. Appl. Publ., 27 pp.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

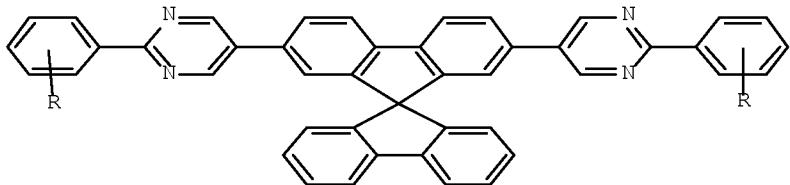
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20040147742	A1	20040729	US 2004-759046	20040120
US 6872824	B2	20050329		
TW 278503	B	20070411	TW 2003-101646	20030121

PRIORITY APPLN. INFO.: TW 2003-101646 A 20030121

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

OTHER SOURCE(S): MARPAT 141:164549

GI



AB Fluorene-based pyrimidine-containing conjugated oligomers used in organic light-emitting devices are described by the general formula I (R = -OCnH2n+1 (n = 1-4), -C4H9, -C6H5, or H). The oligomers may be employed in organizing light-emitting devices as electron-transport emitting layers, emitting layers, a host in the emitting layers, electron transport layers, and hole-blocking layers.

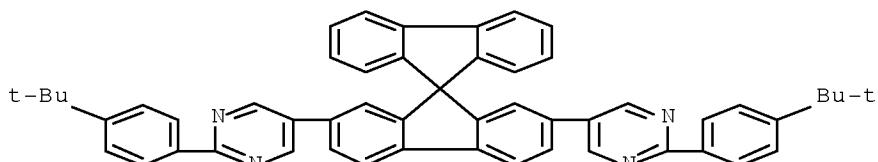
IT 459216-40-1P 728911-50-0P 728911-51-1P

RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)

(pyrimidine spirobifluorene oligomers for organic light-emitting devices)

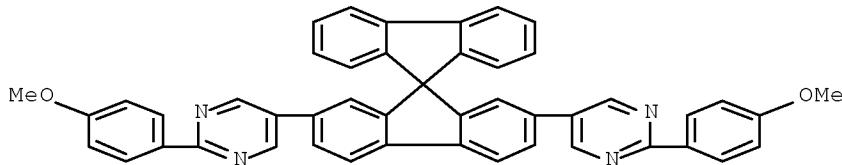
RN 459216-40-1 CAPLUS

CN Pyrimidine, 5,5'-(9,9'-spirobi[9H-fluorene]-2,7-diyl)bis[2-[4-(1,1-dimethylethyl)phenyl]- (CA INDEX NAME)

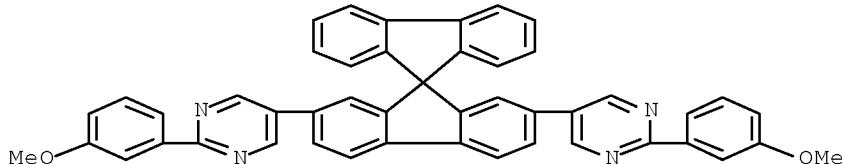


RN 728911-50-0 CAPLUS

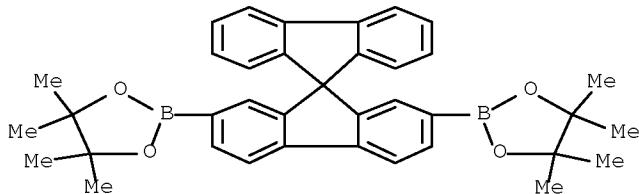
CN Pyrimidine, 5,5'-(9,9'-spirobi[9H-fluorene]-2,7-diyl)bis[2-(4-methoxyphenyl)- (9CI) (CA INDEX NAME)



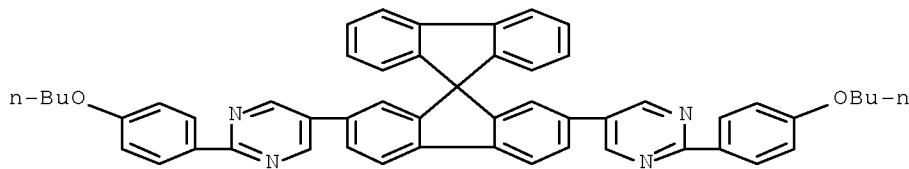
RN 728911-51-1 CAPLUS  
 CN Pyrimidine, 5,5'-(9,9'-spirobi[9H-fluorene]-2,7-diyl)bis[2-(3-methoxyphenyl)- (9CI) (CA INDEX NAME)



IT 728911-52-2  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (pyrimidine spirobifluorene oligomers for organic light-emitting devices)  
 RN 728911-52-2 CAPLUS  
 CN 1,3,2-Dioxaborolane, 2,2'-(9,9'-spirobi[9H-fluorene]-2,7-diyl)bis[4,4,5,5-tetramethyl- (CA INDEX NAME)



IT 728911-49-7P  
 RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
 (zpyrimidine spirobifluorene oligomers for organic light-emitting devices)  
 RN 728911-49-7 CAPLUS  
 CN Pyrimidine, 5,5'-(9,9'-spirobi[9H-fluorene]-2,7-diyl)bis[2-(4-butoxyphenyl)- (9CI) (CA INDEX NAME)

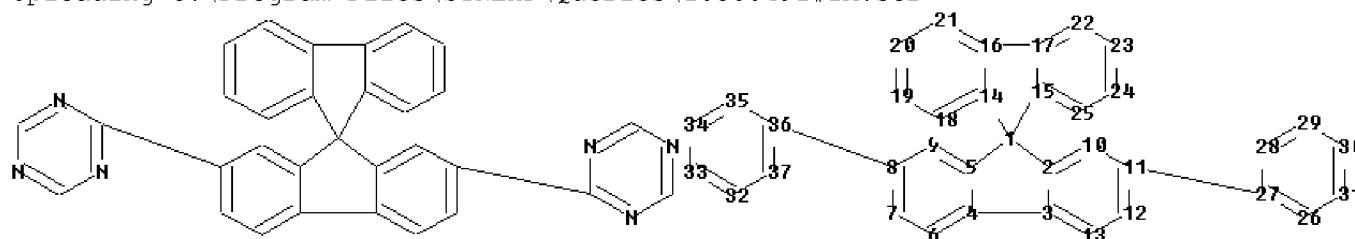


OS.CITING REF COUNT: 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD  
 (1 CITINGS)  
 REFERENCE COUNT: 1 THERE ARE 1 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

=>

=>

Uploading C:\Program Files\STNEXP\Queries\10580491#1A.str



ring nodes :

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23  
 24 25 26 27 28 29 30 31 32 33 34 35 36 37

chain bonds :

8-36 11-27

ring bonds :

1-2 1-5 1-14 1-15 2-3 2-10 3-4 3-13 4-5 4-6 5-9 6-7 7-8 8-9 10-11  
 11-12 12-13 14-16 14-18 15-17 15-25 16-17 16-21 17-22 18-19 19-20 20-21  
 22-23 23-24 24-25  
 26-27 26-31 27-28 28-29 29-30 30-31 32-33 32-37 33-34 34-35 35-36 36-37

exact bonds :

1-2 1-5 1-14 1-15 3-4 8-36 11-27 16-17

normalized bonds :

2-3 2-10 3-13 4-5 4-6 5-9 6-7 7-8 8-9 10-11 11-12 12-13 14-16 14-18  
 15-17 15-25 16-21 17-22 18-19 19-20 20-21 22-23 23-24 24-25 26-27 26-31  
 27-28 28-29  
 29-30 30-31 32-33 32-37 33-34 34-35 35-36 36-37

isolated ring systems :

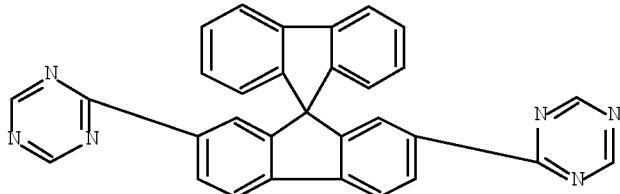
containing 1 : 26 : 32 :

Match level :

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 11:Atom 12:Atom 13:Atom 14:Atom 15:Atom 16:Atom 17:Atom 18:Atom 19:Atom  
 20:Atom 21:Atom  
 22:Atom 23:Atom 24:Atom 25:Atom 26:Atom 27:Atom 28:Atom 29:Atom 30:Atom  
 31:Atom 32:Atom  
 33:Atom 34:Atom 35:Atom 36:Atom 37:Atom

L1 STRUCTURE UPLOADED

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L1 HAS NO ANSWERS  
L1 STR



Structure attributes must be viewed using STN Express query preparation.

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100.0% PROCESSED 10 ITERATIONS 1 ANSWERS  
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FULL FILE PROJECTIONS: ONLINE \*\*COMPLETE\*\*  
BATCH \*\*COMPLETE\*\*  
PROJECTED ITERATIONS: 11 TO 389  
PROJECTED ANSWERS: 1 TO 80

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SEARCH TIME: 00.00.01

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This file contains CAS Registry Numbers for easy and accurate substance identification.

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L4 4 L3

=> d ibib abs hitstr 4

L4 ANSWER 4 OF 4 CAPLUS COPYRIGHT 2011 ACS on STN  
ACCESSION NUMBER: 2003:726758 CAPLUS Full-text  
DOCUMENT NUMBER: 140:163418  
TITLE: Molecular Tectonics. Porous Hydrogen-Bonded Networks  
Built from Derivatives of 9,9'-Spirobifluorene  
AUTHOR(S): Fournier, Jean-Hugues; Maris, Thierry; Wuest, James D.

CORPORATE SOURCE: Departement de Chimie, Universite de Montreal,  
Montreal, QC, H3C 3J7, Can.  
SOURCE: Journal of Organic Chemistry (2004), 69(6), 1762-1775  
CODEN: JOCEAH; ISSN: 0022-3263  
PUBLISHER: American Chemical Society  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
OTHER SOURCE(S): CASREACT 140:163418

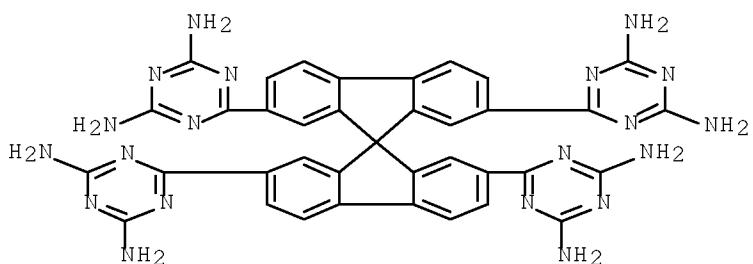
AB Mols. with multiple sites that induce strong directional association tend to form open networks with significant vols. available for the inclusion of guests. Such mols. can be conveniently synthesized by grafting diverse sticky sites onto geometrically suitable cores. The characteristic inability of 9,9'-spirobifluorene to form close-packed crystals suggests that it should serve as a particularly effective core for the elaboration of mols. designed to form highly porous networks. To test this hypothesis, various new tetrasubstituted 9,9'-spirobifluorenes with hydrogen-bonding sites at the 3,3',6,6'-positions or 2,2',7,7'-positions were synthesized by multistep routes. Four of these compds. were crystallized, and their structures were determined by X-ray crystallog. In all cases, the compds. form extensively hydrogen-bonded networks with high porosity. In particular, 43% of the volume of crystals of 3,3',6,6'-tetrahydroxy-9,9'-spirobifluorene (28) is available for the inclusion of guests, whereas the porosity is only 28% in crystals of tetrakis(4-hydroxyphenyl)methane, a close model that lacks the spirobifluorene core. Similarly, the porosities found in crystals of 2,2',7,7'-tetra(acetamido)-9,9'-spirobifluorene (33) and 2,2',7,7'-tetrasubstituted tetrakis(diaminotriazine) 39 are 33% and 60%, resp. Moreover, the porosity of crystals of 2,2',7,7'-tetrasubstituted tetrakis(triaminotriazine) 40 is 75%, the highest value yet observed in crystals built from small mols. These observations demonstrate that a particularly effective strategy for engineering mols. able to form highly porous networks is to graft multiple sticky sites onto spirobifluorenes or other cores intrinsically resistant to close packing.

IT 622011-42-1P

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(crystal structure; porous hydrogen-bonded networks built from derivs.  
of 9,9'-spirobifluorene)

RN 622011-42-1 CAPLUS

CN 1,3,5-Triazine-2,4-diamine, 6,6',6'',6'''-(9,9'-spirobi[9H-fluorene]-  
2,2',7,7'-tetrayl)tetrakis- (9CI) (CA INDEX NAME)



OS.CITING REF COUNT: 64 THERE ARE 64 CAPLUS RECORDS THAT CITE THIS  
RECORD (65 CITINGS)  
REFERENCE COUNT: 126 THERE ARE 126 CITED REFERENCES AVAILABLE FOR  
THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE  
FORMAT

